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£35,000,000 London Electrification Scheme: Is it Stage I?

ONE of the greatest difficulties encountered by protagonists of railway electrification is that of convincing the financial powers that in suitable circumstances electrification is a commercial proposition capable of paying an adequate return on the expenditure involved. In the important scheme announced in the House of Commons on Wednesday by the Chancellor of the Exchequer this difficulty was overcome by the statement that Government credit was to be used to promote the plans for London and suburban railway electrification and improvement, which are estimated to cost £35,000,000. With the aid of an Exchequer guarantee of the necessary loans it should be possible to borrow the money cheaply and to undertake simultaneously the whole of the programme, which is estimated to be completed in five years. The plans, of which we publish details on pages 1133 to 1135, involve the construction of about 12 miles of new tube railway, and the electrification of about 44 route miles of suburban line. This includes the works for which the London Passenger Transport Board is seeking powers in the present session and, in fact, the whole railway scheme is virtually a series of important projections of underground trains over the main line railway companies' suburban lines. Faith in Government support for works of this nature was expressed by Sir Robert Horne, Chairman of the Great Western Railway, on the occasion of his visit to Plymouth in January at a time when many believed that Government assisted schemes had come to an end. This faith has so far been vindicated by the present London scheme. It is to be hoped that this may be only Stage I of a series of important railway works not only in London but in other parts of the country, financed on similar lines.

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Camping Coaches in France

The touring camping coach is a natural development of the original scheme and one that has already been introduced into this country by the L.N.E.R. Even so, it may be felt that a fixed itinerary, as is followed by the L.N.E.R. carriage now running from York, does not quite attain the camper's ideal of freedom, and a plan which must represent the utmost liberty ever allowed to users of the railway, other than those who charter a special train, has just been inaugurated in France. Tenants of these new French camping coaches, which are owned by the State Railways, arrange the route they wish to follow beforehand, and are then taken from place to place by convenient trains. For this service a charge of half the ordinary third class fare for the distance covered is paid by each passenger, and is an addition to the rental of fr. 18 a day, fr. 110 a week, or fr. 400 a month for coaches accommodating parties of eight or ten. The camping coaches themselves are converted vans of the type best known for the inscription "Hommes, 40; Chevaux, 8" which they carried on their sides. They have been repainted white inside and out for their new duties, and fitted with hooks for slinging hammocks, but the supply of camping impedimenta devolves upon the tenants themselves.

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The Week's Traffics

A general increase in merchandise and coal receipts is announced by each of the four group companies for the past week, against small decreases in passenger train earnings except on the London & North Eastern. In every case the totals for the week are larger. For the year to date the passenger train traffics of the four companies together amount to £24,408,000, a net increase of £136,000; merchandise earnings are £21,878,000, a net decrease of £42,000; and coal class traffics at £13,385,000 are down £193,000. For all companies the total traffics to date are £59,671,000, a net decrease of £99,000.

	22nd Week						Year to date.	
	Pass., &c.	Goods, &c.	Coal, &c.	Total.	Inc. or dec.	
	£	£	£	£	£	%
L.M.S.R. ..	− 1,000	+ 12,000	+20,000	+ 31,000	+ 103,000	+ 0·43
L.N.E.R. ..	+ 2,000	+ 34,000	+ 7,000	+ 43,000	− 129,000	− 0·72
G.W.R. ..	− 9,000	+ 8,000	+ 3,000	+ 2,000	− 20,000	− 0·20
S.R.	− 1,000	+ 500	+ 5,500	+ 5,000	− 53,000	− 0·69

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Nigerian Railway and Marine Co-ordination

Unification in the administration of the railways and ports of Nigeria by a single authority has been the subject of discussion for some little time past, but the proposals in this connection have now taken definite shape and comprise the following main points: A central authority should be constituted, under which the Nigerian Railway with its own Manager, and the Marine with its own Superintendent or Manager, would be placed after the retirement of the present Director of Marine. The intention underlying the proposals is to reduce expenditure, to facilitate smooth working and to study the convenience of the public. It is hoped, moreover, to reduce the number of senior officers and concentrate repairs at fewer workshops. Combined stores depots would also make for efficiency. The question of co-ordination in the carriage of coal by sea and by rail is also one which materially affects the issue, as is that of the control of shunting and

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of the existing dual working at ports. A new Port Advisory Board to advise the Government as to the concerted opinion of commerce and shipping on matters relating to the Port of Lagos is also recommended as a supplement to the general scheme. There seems to be little doubt that the General Manager of the Railway with a technical Marine Superintendent to advise him on marine and port matters could, with little modification of his present administration, take over the joint control of the two departments, and that the state of affairs obtaining in South and in East Africa and also in the Gold Coast might be taken as a rough model and adapted to the needs of Nigeria.

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Overseas Railway Traffics

In the aggregate for the 48 weeks of the current year the Buenos Ayres & Pacific has an increase of 3,834,000 pesos or 6·25 per cent.; on the Buenos Ayres Great Southern the advance in currency receipts is 6,696,000 pesos or 6·04 per cent.; the Central Argentine has an increase of 6,835,650 pesos or 7·35 per cent.; and on the Entre Rios, which now has an increase of £3,381 in sterling, the advance has been 1,462,500 pesos or 17·29 per cent. For each of these companies except the Buenos Ayres & Pacific the percentage of increase in currency receipts is rather lower than it was a fortnight ago.

	No. of Week	Weekly Traffics £	Inc or Decrease £	Aggregate Traffic £	Inc. or Decrease £
Buenos Ayres & Pacific ..	48th	87,750	+ 11,415	3,822,676	— 283,112
Buenos Ayres Great Southern ..	48th	116,372	— 5,340	6,887,475	— 574,188
Buenos Ayres Western	48th	44,170	+ 1,379	2,180,592	— 346,999
Central Argentine	48th	126,098	— 4,120	5,846 425	— 449,061
Canadian Pacific	21st	659,600	+ 600	9,267,600	— 172,600
Bombay, Baroda & Central India	7th	267,825	— 8,025	1,480,125	+ 450

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Wagons-Lits Results

Exchange difficulties and other obstacles which more and more impede travel further restricted the flow of traffic for the International Sleeping Car Company in 1934. The strictest economy was exercised in operation and unremunerative services were discontinued where possible, but at the same time there was an extension of second and third class sleeping berths, wagon-restaurant-bars and buffet cars, and buffets were also provided in railcars. Contracts were renewed at the end of the year, on easier terms, with the Italian and Austrian Railway administrations. Financial results are compared herewith, the present rate of exchange being about 145 Belgian francs to the £1, as compared with 110 a year ago.

	1934 Belgian francs	1933 Belgian francs
Profit on working	64,873,681	72,038,300
Dividends and profit on redemption of sterling issues	18,566,914	31,294,746
Total income	83,440,595	103,333,046
Interest and other charges..	61,748,677	65,359,520
Balance	21,691,918	37,973,526
Brought forward	254,638	281,112
Rolling-stock amortisation..	21,800,000	38,000,000
Carried forward	146,556	254,638

As in the previous four years the ordinary shares receive no dividend. Schemes of co-ordination with air transport undertakings are being worked out.

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Mitropa Company Results

The improved position of the German State Railway, reported in our issue of May 31, is reflected in turn in the accounts of the Mitropa Company (Mitteleuropaische Schlafwagen und Speisewagen A.G.) for 1934, the traffic receipts rising from 25·4 million marks in 1933 to 27·7 millions. In July, 1934, there were 180 sleeping and 217 restaurant cars running as against 179 and 212 the year before, and 41 kitchen service cars against 26. Useful car kilometres rose from 82,900,000 to 87,100,000. Accommodation was provided for 830 special trains, in connection with The Oberammergau Passion Play, "Kraft durch Freude" movement, or party festivities, either by restaurant cars or special food supply service. 21 new cars are on order for delivery during the present year. Gross traffic receipts were 27,722,442 RM. and receipts from other sources 1,035,688 RM., totalling 28,758,130 RM. Working expenses took 13,952,333 RM.; salaries and wages 11,300,598 RM.; national insurance and related charges 768,938, RM.; and taxes 590,689 RM.; totalling 26,612,558 RM., and giving a gross operating profit of 2,145,572 RM. Various charges to be met reduced this to 436,847 RM., which set against a debit balance of 799,639 RM. brought it to 362,792 RM., to be carried forward. Herren Heinicken, Schaewen, Klöckner, Hartenfils, and Sommerlatte retired from the board of directors during the year.

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Mountain Railways in Switzerland

The nature of the country in Switzerland has led to the construction of a considerable number of mountain railways, of the rack rail and funicular types, on some of which the ascents are exceedingly steep. The traffic has necessarily been chiefly of the tourist and sight-seeing class, and as long as the number of foreign visitors was maintained at a good level the lines could show some measure of profit in spite of their heavy expenses, even when there were several of them offering their attractions in one district. By the Vierwaldstätter Lake, for instance, four lines are seen, the Rigi, Pilatus, Stanserhorn, and Burgenstock. When the economic crisis came, many of these railways fell into great difficulties, and, according to our contemporary the *Zeitung des Vereins*, the position has been discussed in the Swiss Legislative Assembly with a view to preventing the construction of any further lines for which there is no satisfactory guarantee that a profit will be made. Out of 54 mountain lines, it is asserted, 13 are practically bankrupt, and 18 more are faced with a hardly less serious prospect. The remainder can apparently still keep going. Parliament and the Federal Council have, it is understood, approved the wisdom of the suggested course and any new concessions will be made subject to a careful investigation, being granted only when it can be established that a railway or ropeway meets an actual need and is assured of sufficient traffic.

* * * *

Railway Police Dogs in Germany

Soon after the war the German railways began to make use of dogs in their police service, first in the Berlin and then in the Breslau division. Others followed suit, and now there are no fewer than 700 dogs divided among the various *Direktionen*. In consequence of their successful work the General Management of the Reichsbahn decided in 1933 to put the matter on a regular footing and institute the necessary administrative rules and other formalities. There are six breeds of dogs, including the Airedale terrier, found suitable, but the most satisfactory is considered on the whole to be the German sheep-dog. It is found better to purchase the animals than to breed them specially. Particular attention must, of course, be paid to their fitness. The training follows two courses, according to whether the animals are wanted to be principally as watch dogs, or for tracking down lost objects or suspected persons. The choice of the policemen has proved to be nearly as important as that of the dogs, some persons being unsuited to control them. Regular periodical exercises are also essential to maintain efficiency.

The use of dogs has enabled the police to do more work—and that more efficiently—in the time available, but it is not intended to effect any reduction in the staff. The idea is rather to make the watch on thieves in goods yards, for example, more thorough and effective than before, and so reduce the claims for losses.

* * * *

First German Tunnel Demolished

The German railway centenary, which falls this year, gives additional interest to the recently completed demolition of the first tunnel in Germany, situated at Oberau on the Leipzig-Dresden line. Its construction was begun in February, 1837, and completed in October, 1839, but traffic had been allowed to begin passing through in April of the latter year. It was 513 m. (561 yd.) long, with a gradient of 1 in 220. The top of the arch was only 12 m. (39 ft. 4 in.) below the surface, as the tunnel was made instead of a cutting on grounds of economy. It was lined with sandstone and provided with granite portals of a somewhat ornamental design. Owing to its narrowness the lines were too close for modern stock to clear, and only one train could be allowed in the tunnel at a time, a great inconvenience. In 1932 it was decided to demolish it as this would cost no more than to widen and repair it, the masonry having greatly deteriorated. This necessitated making a bridge to carry the Meissen-Radeburg road across the new cutting. The work involved some carefully planned blasting and was carried out in about a year with day and night shifts at a total cost of 1,350,000 RM., without using a framework within the arch, traffic being deviated to a single line outside as soon as sufficient excavating had been done.

* * * *

A Collision at Liverpool Street

The truth of the proverb that it is an ill-wind that blows nobody good is illustrated in the accident report we deal with on page 1132 herein. It is by Colonel Woodhouse, relating to a collision on November 24 last at Liverpool Street, and commands attention in that it shows the intensity of the traffic into and out of that station. It is observed that train departures from the group of four platforms concerned in this accident take place continuously, during rush hours, at intervals of 2, 2, 4, and 2 minutes. The trains are of the fullest length possible and to protect any fouling of adjacent roads there is a depression bar, but as its indicator is some 12 ft. from the levers controlled by the bar and " it is essential to avoid every second of unnecessary delay . . . it is not surprising that the signalmen have become accustomed to rely on the ' feel ' of the locking," rather than walk to see the indicator, " particularly as visual observation is often difficult, as on this occasion." As the report shows, this continual strain on the electrical lock on the lever of the signal for one of the trains concerned in the accident had worn the lock, so that it was forced out of the tappet and the signal irregularly lowered. More frequent attention to the locking and the removal of the indicator to a more convenient position are recommended.

* * * *

A Signal Removed Bodily

An interesting instance of the rapid removal of a signal post to a new location 60 metres (65½ yd.) distant, on the Netherlands Railways, is reported in our contemporary *Spoor en Tramwegen*. The work had to be carried out in a 57-min. interval between trains. It had been proposed to do it at night when more time was available, but the extra cost involved and necessity of lighting the sites decided the engineering department to attempt the task by day with the aid of the locomotive department's steam cranes. The signal was a three-doll bracket one; the bracket was 8 m. (26 ft. 3 in.) above ground level and 5·60 m. (18 ft. 4 in.) long, the main post was in the centre, and the dolls 3 m. (9 ft. 10 in.) and 2 m. (6 ft. 6¾ in.) high. Its total weight was about 2,500 kg. (2 tons 9¼ cwt.). All preparations being made, the work was begun after the passing of the 11.36 a.m. train. The middle doll was removed to allow the crane hook to be attached to the bracket. The post had to be raised 2·70 m. (8 ft. 10 in.) to clear the ground. By 11.50 a.m. it had reached the new site ready to be lowered, and the operation was completed by noon. The crane moved off, having blocked the line for about 23 minutes, the post was secured, the middle doll refixed and the signal wires reconnected.

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Permanent Way Maintenance

In his sixth contribution to the series entitled " Railway Maintenance Problems " which we publish this week, Colonel Hull enters upon a more controversial field than hitherto. Being an old London & North Western man he is a convinced advocate of shovel or fly packing, and indeed, the high reputation of the North Western permanent way was the best advocate of this system. There will be some differences of opinion over Colonel Hull's theory of wear at rail joints, but his insistence upon a high general standard of maintenance and the insurance of true alignment and a level top is beyond controversy. The first step towards achieving this state of affairs is the provision of ample ballast and drainage, so that the formation may remain stable under all conditions of weather. Our own fairly extensive observation on many different railway systems at home and abroad, indicates that the most uniformly good permanent way is to be found where shovel packing is practised on this solid basis. It is, however, of great importance that, when a change over is made from beater to shovel packing, the permanent way men should be carefully instructed in the new method.

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Steam and Diesel in the Future

The comparison of diesel and electric power with steam power has occasioned a searching and much needed scrutiny of the steam locomotive, the abilities and limitations of which, over a long period of years, had been taken rather too much for granted. It is now evident that many of the advantages claimed a year or two ago for diesel and electric traction can be minimised by modifications made recently in the construction and operation of steam locomotives, particularly those for fast main line duties. In Britain, Germany, America, and elsewhere, the steam locomotive is being remodelled to accomplish economically some of the spectacular things which were considered impracticable before the advent of the diesel. In an article published in the *Iron Age* (and summarised elsewhere in this issue), Mr. G. W. Alcock, of the Lima Locomotive Works, commented severely on the abilities of diesel units, his contention being that steam can hold its own in practically every field, even at sea. We do not think Mr. Alcock's illustrations quite fair to the diesel, but his understanding of the steam locomotive is beyond question and we share his view that remarkable and highly significant developments in steam locomotive traction are taking place, and will continue in the future. For the most efficient operation of a nation's transport, several types of traction are necessary, and if steam locomotives eventually develop to heights as yet undreamed of, no harm will be done by recognising the fact that the birth of the new era was due largely to the advance of other forms of traction.

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Institute of Transport Austrian Tour

TO all who were privileged to accompany the members of the Institute of Transport on their recent visit to Austria the warmth of greeting accorded them by every section of their kindly hosts has been not so much a matter of surprise as of wondering delight. From the time the frontier was crossed and they were welcomed on behalf of the Austrian Federal Railways by Herr Karner, the Chief Mechanical Engineer, to the day a fortnight later when it was recrossed on the homeward journey, it may truly be said that they were receiving continuous hospitality in mind and body from governing, municipal or transport bodies. Looking back upon the series of receptions and inspections provided one seemed to be the whole time in a whirl of instruction and entertainment. No trouble appeared to be too great for these kindly people; language difficulties disappeared and every inquiry was answered with a promptitude and thoroughness which excited our admiration. The success of the congress was also due in a large measure to the influence of the President, the first holder of the office to take part in a Continental visit, who infused into the whole tour a spirit of international *camaraderie*. In his replies to the addresses of welcome at the various functions Mr. Sidney Garcke struck just the right note of comradeship between the Austrian people and ourselves, sympathy with their difficulties, and admiration for the way in which they are surmounting them. It is distinctly encouraging that so many junior members of the Institute of Transport appreciated the educational value of this Austrian tour so ably organised by Mr. Winter Gray and all who assisted him. All who took part in it must have returned with broadened minds. The practice of alternating a congress in Great Britain with a Continental tour every other year has much to commend it, and bearing in mind Rudyard Kipling's dictum, "What should they know of England who only England know? " we believe, all things considered, the foreign visits are the more valuable.

It was appropriate that the entry into Austria should have been by way of the Arlberg Pass, which provides some of the grandest scenery and greatest engineering feats on the whole journey. The ride in the observation car, which had been thoughtfully provided on the special train, impressed upon everyone the stupendous task which had faced the railway engineers and the marvellous ingenuity with which it had been accomplished. The attractiveness of Innsbruck and its picturesque Tyrolese costumes and ancient buildings made one loth to leave. The aerial railways to the snowclad heights were also a novel experience to many members. The stay in Salzburg, which gave an opportunity of visiting the Salzkammergut lakes and the Glocknerstrasse, the most modern highway yet built across the Alps, were experiences not likely to be forgotten. The construction of this great motor road which rises to more than 7,000 ft. above sea level is a remarkable technical achievement of which Austria may be proud, and the journey up to the point now completed, and the still more exciting journey down, through snow drifts higher than the coach roof and along veritable precipices, were not unaccompanied by thrills.

A very pleasing feature of the tour was the welcome extended to the party on arrival at the various halting places, when town or railway bands greeted the arrival of the train with the English National Anthem, a compliment which was highly appreciated. Few of the party will forget the triumphal procession to the Volksgartensale at Linz or the crowd of villagers in native dress who lined the platform at Badgastein. Memories of Vienna will centre round the reception by the Burgomaster in the magnificent Town Hall, the trip to Semmering on the various types of petrol, diesel, and steam railcars used by the Austrian railways, the inspection of tramway and bus works, the view of the city from Cobenzl, and the opera, and cafés and gardens of this great city. Another interesting experience was the tour of inspection of the Danube harbour and the trip up and down the river in the fine steamers of the Danube Shipping Company, which carry an extensive traffic of passengers and goods between Austria, Hungary, Roumania, and the Black Sea.

To the students and younger members of the party the tour must have been in many cases a revelation. Foreign ways and customs are always of interest to the " transport man keen on his job," and while British methods may be thought superior in many cases there is always something to be learnt by the man with an open mind. Electrification in Austria, for instance, has reached a high stage of perfection, and has revolutionised railway operation on mountainous sections of line. The opportunities afforded the party to inspect these lines have been much appreciated. The trip over the Tauern Railway, the latest section to be electrified, was a case in point. The engineering difficulties experienced by the builders of the line in crossing the High Tauern range were considerable and were solved mainly by the driving of a tunnel over 5 miles in length. Such a line, with steep gradients and many tunnels, was obviously one to be electrified, and considerable economy of time and money has resulted. The Institute of Transport Continental tour of 1935 may be adjudged a great success, perhaps even greater than those of former years. The spirit of friendliness which pervaded the whole party was particularly noticeable and added greatly to the enjoyment of all. The excellent programme of visits and inspections was carried out with scarcely a hitch, a friendly people was encountered and contacts and friendships established which cannot fail to be of benefit to all concerned. Knowledge of other nations' ways and methods lead to better understanding of their difficulties and more frequent contacts by visits of this kind cannot fail to promote better relations.

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Charles Dickens's Railway Accident

IMAGINATIVE railway accidents, often of a wildly improbable character, have been introduced into fiction not infrequently to help an author untangle his plot, but the description by an eminent novelist of a well-known accident in which he was concerned is far less frequently encountered. An outstanding instance of such an occurrence was, however, provided by the Staplehurst derailment in which Charles Dickens was involved, of which the 70th anniversary falls next Sunday. June 9 fell on a Friday in 1865, and on that day the fast tidal train of the South Eastern Railway was timed to leave Folkestone for London at 2.30 p.m. on the arrival of the steamer from Boulogne. The fact of its being a tidal train was the primary cause of the accident, as platelayers who were employed in laying down new metals mistook the Saturday departure time for the Friday one, and had about 40 ft. of rail removed at the time the boat express was due to pass through Headcorn and Staplehurst. About midway between these places was a bridge approximately 100 ft. long over which the railway crossed a stream. The train of 14 carriages with about 110 passengers was derailed at this point, the engine and tender lying partly overturned against a hedge and eight of the passenger carriages being thrown about 15 ft. into the stream, which at this season was little more than a muddy ditch over-

grown with weeds. Ten persons lost their lives, most of them probably through being smothered in the mud rather than as a direct result of injuries received.

Dickens was returning from a Continental visit, undertaken to assist his recovery from an illness, and although a passenger in the derailed train did not suffer physical injury. In a brief note penned on the following day he said, " I worked for hours among the dying and dead. I was in the carriage that did not go over, but went off the line, and hung over the bridge in an inexplicable manner. No words can describe the scene." At that time he was publishing " Our Mutual Friend " and in the postscript dated September 2, 1865, which accompanied the last number of the story, he commented on the accident, " I remember with devout thankfulness that I can never be much nearer parting company with my readers for ever, than I was then, until there shall be written against my life the two words with which I have this day closed this book—THE END." By a curious coincidence Dickens died on the fifth anniversary of this accident, and during the intervening years the memory of it was often with him. One of his letters says, " I am getting right, though still low in pulse and very nervous. Driving into Rochester yesterday, I felt more shaken than I have since the accident." Another remarks " I cannot bear railway travelling yet. A perfect conviction, against the senses, that the carriage is down on one side (and generally that is the left, and *not* the side on which the carriage in the accident really went over), comes upon me with anything like speed, and is inexpressibly distressing."

Captain Rich reported on the accident to the Board of Trade and said that the train " had a good proportion of brake power, was drawn by a first class engine, and made up in a proper manner, with communication between guards and driver . . . The provision in these rules " (of the South Eastern Railway) " for always using fog signals when rails are taken up is an additional precaution not generally adopted by railway companies. It appears, however, that for the last ten weeks these rules have daily been disregarded . . ." The coroner's jury returned a verdict of manslaughter against the district inspector and the foreman platelayer; the latter was eventually sentenced to nine months imprisonment. Although speed was not a factor in the cause of the derailment, it may be added that the S.E.R. was then putting up some very good performances in consequence of competition from the London, Chatham & Dover Railway. Following the accident and the celebrated Continental agreement of August 10, 1865, between the two railways, speed in Kent was for many years considered of less consequence than heretofore.

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The Quetta Earthquake

IT is with deep regret that we learn of the severe casualties inflicted upon the railway population of Quetta by the disastrous earthquake which razed the civil and railway quarter of the town to the ground on the night of May 30-31. Though it is believed that no railway officer lost his life, it is, in the absence of casualty lists, only possible at present to be guided by the latest telegrams which place the number of killed at twenty European subordinates, including families, and one hundred Indians, of all railway departments. The numbers of injured are not yet known. Though the area affected by this earthquake is far smaller than that in Behar, desolated seventeen months ago, the concentrated effect of the most severe shocks last week happened, unfortunately, to involve a thickly populated urban district as well as the Indian city of Quetta. Quetta is the headquarters of a division of the North Western Railway from which broad gauge lines radiate in four directions towards (*a*) the Bolan Pass, Sibi, Sukkur, Karachi, Lahore, and Delhi; (*b*) Sibi and beyond via the earlier-built Sind-Pishin loop line with its long, narrow gauge branch to Fort Sandeman; (*c*) Chaman on the Afghan frontier—whence runs the road to Kandahar and Central Asia—via the Khojak tunnel, the longest in India; and (*d*) the East Persian frontier via Nushki. It is therefore of considerable railway importance and is complete with divisional offices, locomotive depôt, and a large traffic staff.

The remarkable point to notice in connection with this earthquake is its localised effect. The railway, apart from buildings in Quetta and possibly elsewhere, seems to have been very little damaged by the severest shock, as trains were running again within a very short time by at least one route from the plains of India, and possibly on the other radiating lines also. Yet not long ago the Bolan line was badly damaged by another earthquake in which Quetta suffered not at all. Subsequent shocks have caused more damage to the railway and delayed the evacuation of refugees and injured, apparently, but no very serious destruction is even now reported. In spite of the earlier damage to the line, casualties among the staff and the influx of relief trains, from 4,000 to 5,000 people were being evacuated by train daily during last week-end, a very creditable performance in the circumstances, especially as long 1 in 25, 1 in 33, and 1 in 40 gradients restrict train loads between Quetta and the plains of India. In this connection we cannot do better than quote from *The Times* special correspondent, who, telegraphing from Quetta on June 4, says:—

> Next to the military, the authorities of the North Western Railway have borne the burden of the evacuation. Sir Guthrie Russell and Mr. J. C. Highet, the Agent of the North Western Railway, have personally superintended the evacuation in the past two days, and believe that the remainder of the inhabitants will be completely transported in two days more. Extraordinary acts of heroism are recorded among the British and Indian servants of the railway. Notable is the exploit of Mr. B. C. L. Dean, the Divisional Superintendent at Quetta, who set off in a trolley car on Friday morning to see if the track was damaged. He made his way alone from Quetta to Spezand, examining the track, and was the first to inform the Government of India of the tragedy. He returned with an incoming train and acted as pilot to see if the track would stand the strain of the load. He ran the pilot engine over one culvert considered weak before entrusting the loaded train to the track.

This same correspondent's eye-witness description of the devastation caused by the earthquake is so vivid that we think it can hardly fail to interest our readers. It runs as follows:—

> I have entered a city wrecked by earthquake before; soon after the Californian community of Santa Barbara had been destroyed I was among its ruins. But that Californian tragedy had no parallel with this in Baluchistan. There the line of disturbance made a clear demarcation which followed the principal street, and even after the shock, the modern lines on which the town had been planned could readily be distinguished. But here in Quetta City there is nothing to pick out. Landmarks have gone as everything has gone. No mosque rises from the ruins to show where men foregathered; the market-place where men met to barter cannot be distinguished today. There is nothing but a widespread mass of grey and tawny *débris*, tapering off into the dun landscape, beyond which in turn is a rim of forlorn and sad hills where no trees grow. It is today a place of utter desolation, made poignant with the misery of a suffering people. The first broad glimpse of this place shocks the imagination, as it emphasises the appalling nature of the catastrophe which came in the night. In this the Baluchistan tragedy differs from that in Bihar last year. Bihar was stricken in the afternoon, when many were out and about. In Quetta it was a valley of sleeping people who went silently to their deaths. This accounts for the immense death-roll.

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Antofagasta (Chili) & Bolivia Railway

BY its own and by operated lines this company provides important international connections. The Chilean ports of Antofagasta and Mejillones are linked up with La Paz, Potosi, Oruro, and Cochabamba in Bolivia by the Antofagasta Company's lines and those leased from the Bolivia Railway Company (in which it has a controlling interest), and by the same means connection is given with Peru, via Viacha and Lake Titicaca. The Antofagasta Company has also worked since 1919 the northern part of the Chilean Longitudinal Railway, which by its junction with the Chilean State Railways gives access to Valparaiso and Santiago. Railway communication with Buenos Aires is provided by a branch from the main line at Uyuni in Bolivia to La Quiaca on the Argentine border, where connection is made with the Argentine State Railways. The whole of the Antofagasta system is metre gauge, and there are two separate administrations, one at Antofagasta covering the lines in Chile, and one at La Paz dealing with the Bolivian lines. The average number of lines open for public traffic in Chile was 491 in 1933 and 1934, as compared with 465 in 1932, the increase being due to the Cerro Negro-Augusta Victoria branch being again opened to traffic. In Bolivia the length of line open has remained at 327 miles. A system of waterworks is also part of the company's undertaking.

The report for the year 1934 shows that the receipts of the whole undertaking were £802,445, an increase of £211,428 or 35·77 per cent. In the working expenses of £493,980 there was an increase of £87,721 or 21·59 per cent., and the net receipts of £308,465 showed an increase of £123,707 or 66·96 per cent. Receipts of the railway showed an increase of £195,628 or 35·42 per cent., and though railway working expenses increased by £75,976 or 20·38 per cent., the operating ratio was reduced from 67·49 per cent. to 60 per cent. The chief factors affecting the increase in working expenses were the greater volume of traffic handled and the rise in the official rate of exchange for the Chilean peso; additional local taxation and expenditure incurred in repairing damage done by floods were also contributory causes. Nearly all classes of traffic gave increased tonnages, but more particularly nitrate, copper bars and high grade tin barrilla in the down traffic, and general merchandise, articles for the mining industry and fuel in the up traffic. Passenger traffic gave improved results principally because of labour imported for the mines in Bolivia and the transport of troops for the Bolivian Government. On the Chilean section there was an increase of 10·85 per cent. in the number of passengers and 27·50 per cent. in passenger receipts. Public goods traffic on the Chilean section increased by 34·42 per cent. in quantity, and on the Bolivian section by 5·60 per cent. Financial results for the two years are compared in the accompanying table:—

	1934	1933
	£	£
Railway gross receipts	747,959	552,332
Railway working expenses	448,756	372,780
Railway net receipts	299,203	179,552
Total income	706,430	626,905
Debenture interest, rentals, and exchange differences	311,246	278,212
Renewals account	—	38,000
Exchange reserve	261,000	70,000
Carried forward	134,184	240,693

Although the operating results showed considerable improvement, the exchange difficulties have prevented any relief being secured to the stockholders, the directors having had to allocate £261,000 to exchange reserve in consequence, as announced in their preliminary statement. Arrears of dividend on the 5 per cent. cumulative preference stock date from January 1, 1932, and the last payment on the ordinary stock was 4 per cent. for the year 1930, against 7 per cent. for 1929.

* * * *

Welding on Railways

FROM the point of view of the average British railway engineer, the film displays arranged on May 22 at British Industries House, by the Acetylene & Welding Consulting Bureau Limited, Murex Welding Processes, Limited, and the British Oxygen Co. Ltd., although of general interest, were apt to leave a sense of some disappointment in that they did not contribute much to the solution of one of his great difficulties—namely, how to repair important structures by welding. Often the steelwork to be repaired cannot be entirely relieved of stress before the addition of new plates or new metal, and to make matters worse, unknown and often relatively high stresses are induced by the cooling of the metal after welding. It is possible to over-stress one part of a structure by welding another part of it, and until the principles involved are thoroughly understood, one of the apparently most useful applications of welding will not be adopted generally by those responsible for the safety of our railway structures. This, of course, is not to say that welding has not already a wide and widening field of application on railways. Articles we have published from time to time amply demonstrate this, and the film displays to which we have already referred were useful in bringing home to those who saw them how rapidly the art is developing. Examples of the application of the electric arc process were shown in the L.M.S. locomotive works at Crewe; the construction of an island platform roof on the same railway; and the fabrication of the underframes of the L.N.E.R. coaches now being made for the Silver Jubilee Express, which, beginning in October, is to cover the 268 miles between Newcastle and London in 4 hours. Oxy-acetylene and oxygen cutting of steel was also illustrated, showing speeds of cutting varying from 90 ft. per hr. for half-inch plate to 26 ft. per hr. for metal 13 in. thick. Another interesting demonstration was that given by Murex Welding Processes Limited on May 23, which included the various stages involved in the manufacture of electrodes.

OTTOMAN RAILWAY FROM SMYRNA TO AIDIN.—The Grand National Assembly of Turkey has formally ratified the agreement, signed on May 1, whereby the Ottoman Railway from Smyrna to Aidin will become the property of the Turkish Government. Meetings have been convened for June 26 at Winchester House, E.C., to obtain the approval of the stockholders and shareholders to the agreement, which must be ratified before July 1 next or it will become null and void. The scheme of arrangement, to which reference was made last week, will be submitted today (Friday) to separate meetings of the different classes of holders. If the scheme is approved by the stockholders and is sanctioned by the Court and the agreement is ratified, the railway will be considered as having been worked for the account of the Turkish Government as from June 1, and interest on the £1,825,840 of 7½ per cent. Turkish Government bonds to be received in consideration of the sale will accrue as from that date. Amongst the proposals in the scheme is that after these bonds have been deposited a company, to be named the Ottoman (Smyrna to Aidin) Railway Holding Co. Ltd., shall be formed with a share capital of £22,000 in 440,000 shares of 1s. each, and having for its objects the acquisition, holding and realisation of all or any of the said bonds and any of the moneys, properties, and assets of the parent company not sold to the Turkish Government under the sale agreement.

PUBLICATIONS RECEIVED

Studies on Industrial Relations : III. (Studies and Reports, Series A (Industrial Relations), No. 38.) Geneva : International Labour Office (League of Nations). London : P. S. King & Son Ltd., Orchard House, 14, Great Smith Street, S.W.1. 9¾ in. × 6½ in. 185 pp. Cloth. Price 6s. ($2·00).—This volume contains a further series of studies on industrial relations, supplementing those published under the same title in 1930 and 1932. The studies were previously restricted to European countries. In the first series were included studies on the London traffic combine and on the State mines of the Saar Basin, and in the second series, studies on the F.I.A.T. establishments. In the present work two of the five articles deal with undertakings in North America, *i.e.*, the Canadian National Railways and the Pequot Mills of the Naumkeag Steam Cotton Company, Salem, Mass., U.S.A. The other three concern a Paris Department Store (La Samaritaine) ; the Norwegian Nitrogen Company ; and the Grand Duchy of Luxemburg. From our point of view, particular interest attaches to the article on the Canadian National Railways and that on the Arbed undertakings (United Steel Works of Burbach, Eich and Dudelange, in Luxemburg). In the case of the Canadian National Railways there is considerable variety in the practice of industrial relations, seeing that so large an extent of territory is covered by the system, but this variety is always subject to the guiding principle of the labour policy of the company, which is to ensure the active and willing co-operation of the staff in all grades and occupations. The most distinctive feature of industrial relations on the Canadian National Railways is the " Joint Co-operative Plan," of which the constitution, origin and development are fully set out in the volume before us. There are seven railwaymen's unions, which organise railwaymen both in the United States and in Canada, but the Canadian Brotherhood of Railroad Employees has no international affiliations. The industrial development in the Grand Duchy of Luxemburg described in the fifth article is well worth study, and it is a striking fact that since 1921 industrial peace has reigned in that country.

Piles and Pile Driving. By A. C. Dean. London : Crosby, Lockwood & Son Ltd., Stationers' Hall Court, E.C.4. 9¼ in. × 6 in. 221 pp. Illustrated. Price 42s.—The actual driving of piles, although an ancient process, has developed so rapidly in recent years that it can be carried out with the same degree of accuracy and expedition obtained in other civil engineering operations. The bearing capacity, however, is still very much of an unknown quantity before, and to a certain extent after, driving. This is well brought out in Mr. Dean's book, which is a concise but thorough treatment of the subject. The author describes various wood, steel, and concrete bearing piles and sheet piles, including plant and methods used in driving them. Details of many cast-in-situ reinforced concrete piles are given.

Of the numerous formulæ evolved for determining the bearing capacity of piles, 86 are given with either the mathematical proofs or an indication of the methods by which they have been evolved, together with the limitations of many of them. The author, however, states that " experience gained by prolonged observation of piling operations of various kinds is far more likely to give a true estimate in any particular case, and suitable formulae may be used as a check on this experience."

Methods of considering the stability of sheet pile retaining walls and of coffer dams are given and the book concludes with useful data in tabular form. The author has put into this work the product of many years of experience and study, quoting a large number of authorities, and the result is one of the first books dealing entirely with this subject.

" The Railway Times " of India : Jubilee Supplement.—A remarkable special Silver Jubilee supplement has been published by *The Railway Times*, the organ of the N.U.R. of India and Burma. Its silver cover is graced by a particularly good portrait of the King, a reproduction of a pencil drawing, and there are also 44 illustrations forming a " Cavalcade " of the 25-years' reign. Among many other illustrations are 10 of Indian locomotive types and a number of other subjects of interest. The supplement is in striking contrast to the ordinary issues of *The Railway Times*, which is to be congratulated upon the former.

Irish Holidays.—It is a fact to be deplored that for so many people Ireland should be a place " unknown," and it would seem that while so near, Ireland is yet so far. But if the beauties of the country were fully realised, it is safe to assume that there would be a large movement of holiday makers and tourists across the Irish Channel, and the prejudices which have arisen through political disturbances of the past would soon be forgotten. That the Great Northern Railway of Ireland, however, is playing its part in endeavouring to make Ireland more popular with tourists from Great Britain and overseas is evidenced by the attractive literature and posters now being issued. This year the company has published two very interesting booklets—" Magic Miles in Ireland " and " Holidays in Ireland." The former is a descriptive guide of 55 pages with a map, and tells how the visitor to Ireland can best get to the heart of the country's beauty, its life and its people. " Holidays in Ireland " comprises the tourist and excursion arrangements of the company for the coming season. Copies of four new posters are also to hand. " The Golden Coast " is a quad-royal advertising the Irish Coast north of Dublin. The other three are double-demy size, illustrating Enniskillen, Warrenpoint, and Bundoran. The posters, which are in seven colours, are well executed in modern tints. Copies of these booklets and the posters may be had on application to the Traffic Manager, Great Northern Railway, Belfast.

Triple Lock-nuts.—We have received from Vislok Limited, Caxton Street, Market Harborough, a folder showing the principles and exclusive features of Vislok triple lock-nuts. These can be used on any ordinary, unprepared bolt, thereby doing away with the necessity of drilling to take a split-pin, which not only weakens the bolt, but calls for skilled labour. The Vislok can be locked in any position along the thread, even if unsupported, by no more than the use of two spanners, and applies three simultaneous and interdependent grips on the bolt. Once secured, it cannot slacken or shake out of position.

Ball and Roller Bearings.—A very comprehensive general catalogue has just been issued by the Ransome & Marles Bearing Co. Ltd., of Newark-on-Trent, and even a casual perusal of its pages suffices to convince the reader that whoever is responsible for its compilation not only knows his subject very thoroughly, but has marked ability for conveying to others in a convenient and attractive form all that they can want to know about the types and sizes of the bearings manufactured and supplied by the firm, and the question of mounting and maintenance. The subject matter is arranged in such a manner that the catalogue forms a book of reference on methods of applying and maintaining ball and roller bearings. Clearly printed on highly surfaced paper with numerous sectional drawings and half-tone reproductions, the mass of data contained in the catalogue is set out in a two-colour style which not only adds to the attractive appearance of the pages, but enables one the more readily to pick out what is wanted. The catalogue measures approximately 12 by 8¾ in. and is securely bound in semi-stiff covers, the attractively designed outer one showing a reproduction of ball and roller bearings in colour and the name of the firm in gold lettering on a white background. The comprehensive index is supplemented by a thumb index so that any required application can be speedily turned to. In all there are 108 pages, and the frontispiece takes the form of a bird's-eye view in photogravure of the Ransome & Marles works at Newark-on-Trent. We should certainly recommend users of ball and roller mountings to apply to the firm for a copy of this catalogue, which ranks among one of the best examples of literature of its kind that has passed through our hands for some time past.

XUM

THE SCRAP HEAP

According to a special correspondent of the *North China Daily News*, an extraordinary state of affairs recently occurred during the construction of a new railway in North China. A range of mountains had to be pierced by a tunnel, and headings were driven from both ends. Unfortunately the two headings made a complete miss in the centre of the mountain range, and the engineer responsible is stated to have hurriedly disappeared, fearing the wrath to come, and has not since been discovered.

* * *

A press report from Berlin states that in its first week of operation nine persons were killed on the Moscow underground railway. Policemen have been posted on the station platforms and in trains to prevent travellers from doing damage. In the same period 41 persons were arrested for slashing the upholstery and breaking the windows of trains.

* * *

Women carriage cleaners employed by the New York, New Haven & Hartford RR. will in future wear plus fours. A standard specification for these garments appears to have been drawn up by the company, which states that they will be more close fitting than the type worn on golf courses but will allow full freedom of movement. The ban on skirts results from accidents caused by their becoming entangled in yard machinery.

* * *

Formal proceedings have been instituted for the canonisation of an Italian railwayman, Paul Pius Porazzo, whose tomb at Pinerolo became a place of pilgrimage after his death in 1911, and is reported to have been the scene of miracles. Porazzo was born at Nizza-Menferrato in 1846 and was for 30 years employed by the Italian State Railways. His saintly life and the bravery of his conduct in the wars for Italian independence earned him the veneration of his fellow workers, over whom his pious example exercised deep influence, so that his fame has lived after him and has even increased sufficiently to warrant investigation by the ecclesiastical authorities.

The memory of one of the Englishmen who played an important part in the inauguration of the German railways is to be honoured in the forthcoming centenary celebrations. He is William Wilson, the engine-driver whom George Stephenson sent over to Germany with *Der Adler*, the first locomotive of the Ludwigsbahn. As recorded by Herr Franz F. Schwarzenstein in his article published in our issue of February 23, 1934, Wilson drove this engine at the inauguration of the Nuremberg-Fürth line on December 7, 1835. He was so highly regarded for his mechanical skill that he was paid 2,250 marks a year, whereas the manager of the railway received only 1,360 marks. Wilson, who was born at Walbottle, Tyneside, on May 18, 1809, died at Nuremberg on April 17, 1862, and was buried in a quiet corner of St. John's cemetery there.

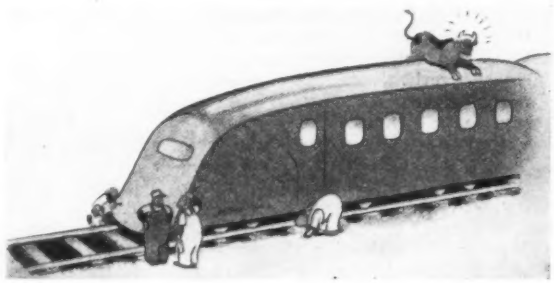
* * *

Scottish traveller (to Irish traveller): "What would ye say if I told ye that the fastest trains in the worrld are in sairvice north of the Tweed?"

Irish traveller: "Begorra, I should say there's no sense in such nonsense."

THE ADVANTAGES OF STREAMLINING

Diesel Train Driver (to the train crew): "I am positive that we ran over a cow, but the animal is to be seen nowhere around, and as you see, there's no sign of our having hit it!" — From "Spoor en Tramwegen."



One Hundred Years Ago

Extracts from the June, 1835, issue of "The Railway Magazine" (afterwards "Herapath's Railway Journal") and the oldest constituent of THE RAILWAY GAZETTE

CONVEYANCE OF TROOPS BY THE RAILWAY.—In the Committee on the Western Railway Bill, Mr. G. Stephenson, the civil engineer, stated that by the proposed Railway ten thousand soldiers might be conveyed from London to Bristol in four hours!

RAILWAYS IN INDIA.—Canals must depend for their utility upon a regular supply of water; and in many parts of India it might be difficult to secure it. In such circumstances Railways present an admirable substitute. Even where the difficulty of obtaining water was not great, Railways might be preferable in cases where the probable amount of traffic was limited. The expense of such works would be far less than in England. In our country an enormous proportion of the expense, varying from a third to a half, arises from the purchases of land, fencings, parliamentary and law proceedings, and other causes independent of the mere construction of the Railway. In India some of these charges might be avoided altogether, and others would be very much reduced. The actual expense of the work would also be less than that of similar undertakings in England. As the traffic would be comparatively small, a single road, with occasional passing places, would be sufficient; and as the weight of the carriages and lading would be much less, the rails might be proportionately lighter. Labour in India is vastly cheaper than in England; and, under these circumstances, the cost of Railways would be extremely moderate. At present, perhaps, the use of animal power would be the most advantageous; but this, of course, would form one point of inquiry with those who might be disposed to undertake such works. There are various lines upon which Railways would be immediately profitable, and if the resources of India should be improved to the full amount of their capabilities, a necessity for fresh lines would be created, whilst the old ones would become increasingly lucrative.—*Thornton's India.*

"THE LONDON AND BIRMINGHAM RAILWAY," says the *Birmingham Advertiser*, "is chiefly in the hands of large capitalists. There is one holder of a thousand shares, and another of five hundred. A call of £10 per share (making £35) became payable on Wednesday, April 15, and we hear that more than £200,000 was received by the treasurers before the end of the same week."

TRAVELLING ON THE SABBATH DAY*.—On the question that the Report on the Great Western Railway Bill be further considered, Mr. Miles moved that a clause to the following effect be inserted in the Bill:—"That no engine or other carriage should travel on this Railway on the Lord's Day, and that in case it did, the Company and their successors should be liable to a penalty of £20 for each engine or carriage so travelling." The clause was rejected by a majority of 212 to 34.

* Commenting on this subject, the *Sunday Times* of May 31, 1835, said: "The Sunday Puritans have again been flung. After seeking the Lord in prayer, Mr. Miles ventured a clause, on the discussion of the Great Western Railroad Bill, 'to prevent any engine or carriage travelling that road on the Lord's Day, and imposing a penalty of twenty pounds for every violation, on the company and its successors.' The house was sensible enough to scout this clause by a majority of 178."

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

SOUTH AFRICA

Functions of the Railways and Harbours Board

The annual report of the Railways and Harbours Board for the calendar year 1934, just issued, refers to the amended regulations governing the functions of the board. These regulations provide for the appointment of the senior member of the board as Chief Commissioner to act as liaison officer between the Minister and the board in respect to all ordinary functions of the board as well as such other matters in which the Minister may decide to consult or instruct the board. In the absence of the Minister, the Chief Commissioner, in consultation with his colleagues, regulates and organises all inspections, investigations and other activities of the board, and for that purpose gives the necessary instructions to the Secretary of the board.

Witwatersrand Improvements

Reviewing the administration's operations for the year, the report states that, as a result of the intensive goldmining activity in the Witwatersrand area, the position has become particularly acute, and, to cope with the ever-increasing traffic, it has been decided to electrify the main passenger suburban lines in that area. As goods traffic has outgrown the available facilities, proposals involving extensive yard alterations and additions at the more important depots in the area, the construction of additional tracks on some sections, and the provision of certain other facilities, have been tentatively adopted.

New Construction Policy

In dealing with the many requests for new branch lines and for extensions of existing lines, the board has had regard to the revolutionary changes which transport conditions generally have undergone. In former years the railway was the only efficient medium for opening up new areas, whereas under present-day conditions the transport needs of outlying districts are being adequately catered for by the administration's road motor services, which are operated at infinitely less cost to the State from the point of view of both capital outlay and interest liability. For these reasons the board is not able to recommend the construction of new railways or extensions of existing lines unless it can be definitely established that road transport cannot adequately cope with the requirements of the particular area, and that the volume of available traffic is such that a railway will be an economic proposition. In cases where individuals or bodies are prepared to furnish financial and other guarantees, the board is prepared to recommend the building of railways on the basis of a definite guarantee that any losses in working will be made good by the guarantors.

Tourist Traffic

As a result of the administration's comprehensive overseas advertising campaign, coupled with the general improvement in economic conditions, the number of visitors to the Union during 1934 totalled 10,363, an increase of 2,262 on the previous year. These included two cruise-parties, one ship bringing 235 tourists and the other 239, a large number of whom made lengthy railway tours in the Union.

Special Service Battalion

Since the inauguration of the scheme —referred to in THE RAILWAY GAZETTE of October 19, 1934—under which recruitment of youths from the Special Service Battalion as European labourers and for junior grades has operated, 974 youths have been drafted into the service. The reports of controlling officers indicate that the scheme has been such an unqualified success, that it has been decided to establish the training school on a permanent basis, with accommodation for a lecture room and two dining cars, from which it is anticipated that the requirements of the administration in regard to the catering staff will be met adequately.

NEW ZEALAND

Line-side Fire Prevention

Grass fires adjacent to the railway line are a constant source of trouble in New Zealand. Much has been done and £35,000 have been spent by the Chief Mechanical Engineer's Department in perfecting the spark arrester as detailed in the THE RAILWAY GAZETTE of October 5 last. In addition the Railway Department assists adjacent landowners or local bodies who undertake the ploughing of firebreaks on railway land by bearing 50 per cent. of the cost of the work, and moreover, lessees of railway land are prohibited from growing anything but root or green crops in order to reduce the fire risk. The department has also assisted in defraying the cost of making firebreaks on private property where it was considered the cost was justified.

Proposed Napier-Gisborne Railway

As a means for having this proposed 146-mile railway considered again as a Government undertaking, those interested have petitioned that the Transport Co-ordination Board be asked to report on the project. This board is charged with the duty of making recommendations to the Government for securing the improvement, co-ordination, and development of all means and facilities for transport, and is authorised to make the fullest enquiries and investigations. Points which the board might, in this case, be expected to consider are:—

(*a*) The incentive which the line would give to the development of the district, and the possible increase in production of already settled areas; (*b*) the feeder value of the line to the trunk railway system and the quantities of goods, stock, and passengers that it might reasonably be expected to carry; (*c*) the inadequacy and costliness of present means of transport and the great loss and waste caused through the use of unsuitable roads by heavy traffic and travelling stock; and (*d*) the heavy expenditure involved if roads are to be reconstructed and maintained in accordance with modern requirements.

The traffic survey estimates a return of 4 per cent. on the capital involved.—[It is interesting to note in this connection that a message from Wellington, dated May 28, indicates that a British syndicate is prepared to find a sum of £2,000,000 to make the completion of this line possible.—ED., *R.G.*]

ARGENTINA

Future of the Transandine Railway

The series of misfortunes—economic and due to the forces of Nature—which has pursued the Transandine Railway for the last few years has culminated in a proposal that the line should be taken up and replaced by an international motor road. The principal reason given for this suggestion is the very high cost—estimated at many millions of Argentine paper dollars—of rebuilding the line, many kilometres of which, including both bridges and track, were washed away by the abnormal floods of January, 1934. It is pointed out that the existing road is entirely inadequate for the purposes of an international highway, and a new one would therefore have to be constructed, a project which is being studied by a technical committee. The cost of the Argentine section is estimated at some $2,000,000 paper, but it is stated that the Chilean section would be much less expensive, as the roads there are in a better condition, and would require very little in the way of repairs.

Prospects of International Road Traffic

The proposal to replace the railway by a road raises some interesting speculations as to exactly what extent improved facilities for road traffic across the Andes would affect the international passenger traffic carried by the B.A. & Pacific Railway. The construction of a motor road between Argentina and Chile is not expected to offer any insuperable difficulties, but the problem of keeping it open during the winter months may not be altogether easy of solution. For this reason, road traffic during most of the year would, presumably, be chiefly

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between Mendoza and railhead at Punta de Vacas (on this side of the Argentine frontier), as at present. Since the organisation of the motorcar service between these two points in September last, the C.I.T.A. Company (Compañia Internacional de Transportes Automoviles) has been so successful in handling through international traffic, in conjunction with the Chilean Transandine Railway, that the public has suffered little inconvenience in making the journey between the two republics. Between September 1 and March 31, the total number of passengers who made the trip between Argentina and Chile and *vice versa* by the Uspallata route was, approximately, 7,000. During the previous financial year, from July 1, 1933, to January 10, 1934, (the date on which the disaster to the railway occurred), the total number of passengers carried was 1,200. Those carried during the current financial year included 1,300 pilgrims from Chile to the Eucharistic Congress, held in Buenos Aires in October last, who were conveyed across the Andes by the C.I.T.A. Company within a few days without the slightest hitch.

More Traffic due to Reduced Fares

Another reason for improved international traffic during the current season is the fact that the Villalonga Express Company instituted reduced tourist fares between Buenos Aires and Chile and *vice-versa*, and up to March 31 last some 1,500 of these cheap tickets had been issued.

The construction of a motor road across the Andes, of the standard obtaining in Switzerland, for example, would undoubtedly shorten the journey between Mendoza and Punta de Vacas. This has been demonstrated by the fact that since the C.I.T.A. Company undertook the maintenance of the existing road under Government contract, the route has been so much improved that the time taken by their fast vehicles to cover the distance between these two points has been greatly reduced. During the winter months the last 20 km. of road below Punta de Vacas would probably require special snow protection, as that place is above winter snow-level, but this difficulty could be overcome by constructing a portion of the road at a higher level on the mountain side—a project at present under consideration by the authorities.

Institute of Transport (Argentine & River Plate Centre)

The annual meeting of this centre was held in Buenos Aires on April 24, with Mr. J. Wilson, O.B.E. (Traffic Manager, B.A.G.S. and B.A.W. Railways) in the Chair. The report and statement of accounts were submitted, and the silver medal, presented by Mr. C. A. Roberts (General Manager, B.A.W. Railway) for the best graduate paper of the year, was awarded to Mr. A. Dean (B.A.G.S. Railway). Mr. J. G. Mayne, of Percy Grant & Company, was elected Chairman for the ensuing session, and the following were elected members of committee: Messrs. H. G. Beckwith, G. C. Bonner, F. Bottomley, F. C. Egerton, Ll. W. Makin, K. Marshall, G. R. Mawson, J. A. Meelboom, E. St. John Parry, A. T. L. Pride and H. E. Taylor.

ITALY

Popular Sunday Trains

The popularity of these excursion trains last year has induced the State Railways to increase their number this summer to 1,400, to be run between June 2 and September 29 next. Also a number of popular international trains will be organised on a larger scale than in previous years, and negotiations are in progress with the French, Austrian, and Hungarian railways with this end in view.

Fly-shunting Containers on Trucks

The Minister of Communications recently assisted at the experiments which, at the instance of the International Container Bureau in Paris, were carried out at the Milan marshalling yard with several new types of containers. Tests were also made with various methods of securing the containers to the trucks for the purpose of studying their behaviour during shunting operations. A number of trucks with loaded containers were fly-shunted against standing loaded 30-ton trucks and special measuring apparatus registered the shock to the containers. MM. Drugeon, Renevey, and De Busson represented the French railways, and Herr Sommerlatte, accompanied by Herr Culemeyer, the German State Railway.

INDIA

Jubilee Traffic

The railways serving Calcutta were called upon to carry exceptionally heavy traffic on May 6 and 7. Crowds from up-country stations, taking advantage of the cheap tickets issued for the occasion, flocked to see the decorations of public and private buildings, illuminations and fireworks arranged in Calcutta for the celebration of the King-Emperor's Silver Jubilee. At Howrah, the East Indian and Bengal-Nagpur joint terminus, arrivals and departures numbered about 80,000 passengers, and at Sealdah, the Eastern Bengal terminus, 25 per cent. increase in passengers was recorded, or nearly 30,000. Special trains were run from all directions on the E.B.R., and some also by the East Indian Railway.

Transport Developments in Southern India

It is understood that a special officer appointed by the Government of Madras to investigate and report on the transport position in that Presidency has submitted a tentative report recommending several schemes of rail and road development. The proposed extension of the Mysore Railway from Chamrajnagar, in Mysore, to Satyamangalam, in the Coimbatore District in British India, is favourably reported on. This scheme—which has several times been referred to in these columns—has been under consideration for some time, and hesitation to adopt it is due to the high cost of the difficult construction works involved in the descent from the Mysore plateau. Another railway that the report favours is a metre gauge connection between Madras Beach and Renigunta and Tirupati. The special officer, however, does not recommend the construction of the Madura-Karaikudi line.

FRANCE

Paris Metro Profits Increase

For the year 1934 the Cie. du Chemin de fer Metropolitain de Paris shows net profits of fr. 30,481,847, against fr. 28,420,345 in 1933, according to the report presented to shareholders at the annual meeting on May 24. The dividend is fixed at fr. 60 a share, against the previous fr. 55.

The year was notable, states the report, for the opening of the three first suburban lines, the total length of which amounts to a little more than 3½ miles. The total length of the whole Metro system is now 90 miles. Work is in progress on three additional suburban extensions out of twelve already authorised. Headway is also being made with the electrification of the P.-O. line from Paris-Luxembourg to Massy-Palaiseau and Sceaux-Robinson. This line will be opened for Metro traffic probably in the second half of 1936, and runs about ten miles into the outer suburbs.

The number of tickets issued in 1934 was 665,835,362, including 21,212,956 on the suburban lines. In 1933 the total was 654,111,323 tickets. Counting workmen's return tickets as two, the total number of journeys was 851,989,011, against 838,320,154 the previous year. Passenger receipts amounted to fr. 516,495,360, against fr. 509,571,711 in 1933. Operating expenses were fr. 383,163,952, an increase of fr. 11,501,707. The increase was due to the extension of the company's lines by nine miles during the year.

CHINA

Opening of Nanking-Wuhu Railway for Passenger Traffic

The first passenger train arrived at Nanking from Wuhu on April 21. It consisted of eight coaches behind the tender and returned to Wuhu the same evening. An increased service was due to begin on May 1, and arrangements are being made for through services from Wuhu via Nanking to the Tientsin-Pukow and Nanking-Shanghai Railways to be inaugurated about September next.

OUR CENTENARY—MESSAGES FROM READERS

As announced in our May 3 issue, "The Railway Gazette" and the journals incorporated with it have completed 100 years of continuous publication

THE following is the fifth instalment of the many messages we have received in connection with the centenary of THE RAILWAY GAZETTE and the various railway journals now incorporated with it, the earliest of which made its first appearance on May 1, 1835. In expressing our thanks to all who have written, may we say how greatly we value their appreciative and encouraging messages.

Mr. R. E. Kimberley, Chief Mechanical Engineer, Buenos Ayres & Pacific Railway, Buenos Aires.

The usefulness of any technical publication depends principally on the interest of the reader. To the mechanical engineer in South America, it can be said that THE RAILWAY GAZETTE keeps him in touch with what his colleagues in other parts of the world are doing, and he is thus kept up to date in all matters of importance. The *Diesel Traction Supplements* of THE RAILWAY GAZETTE are of value to those who are following with interest the development of this form of traction.

Dott. Ing. Prof. Marco Semenza, Chairman of International Advisory Committee on Electric Traction Equipment of the International Electrotechnical Commission, Milan.

It is a great editorial achievement, which I think is shared by no other technical paper in the world, to have completed 100 years of continuous publication. THE RAILWAY GAZETTE must be proud of this result, which is due to its perfect and timely technical and economical information, to the thorough handling of the most interesting problems of the railway life, and not least to the splendid illustrations which serve so much to give variety and interest to a technical paper.

What I think also should be commended by all railway people in the world is the very clever way in which all problems of electric and diesel traction are discussed in the two supplements added recently to the paper. In the actual moment in which the railways are undergoing in all the world such a profound change in all fields, I am sure that if THE RAILWAY GAZETTE should not be received regularly it would be heavily missed by all railwaymen, much more than in quieter times. Nobody could be able to keep in touch with the almost phantasmagoric production of new systems and appearance of new ideas, and therefore a great element for right judgment would be lost.

Mr. W. A. Moyers, Chief Civil Engineer, South African Railways and Harbours, Johannesburg.

I have much pleasure in sending you my congratulations on the fact that THE RAILWAY GAZETTE and the journals incorporated with it have completed 100 years of continuous publication.

Your journal serves an extremely useful purpose in keeping the officers of overseas railways in touch with the work and improvements on the railways of the Empire.

Mr. W. E. Turnbull, System Manager, South African Railways and Harbours, Durban.

I heartily congratulate THE RAILWAY GAZETTE and the journals now incorporated with it on the completion of a century of continuous publication. I should especially like to take the opportunity of expressing a short but pertinent opinion of the services performed by the GAZETTE as affecting railway management and operation in the Union of South Africa.

Apart from the fact that a hundred years of issue of the journal may be characterised as a remarkable achievement in the world of modern journalism, I would point to the very salient fact that the extensive knowledge contained in its columns always has been of the profoundest practical assistance to railwaymen in this country.

It is difficult to discriminate as to which items have borne the greatest interest, where each and every article has been of such absorbing usefulness.

Mr. E. W. Test, Assistant to President, Pullman-Standard Car Manufacturing Company, Chicago.

We offer our congratulations to THE RAILWAY GAZETTE on having completed 100 years of continuous publication. Among the many excellent features of the journal, we find the *Diesel Supplement* very interesting as indicating the trend of this type of equipment in Europe and other parts of the world.

Mr. J. Edwards, Chief Accountant, Buenos Ayres Western Railway, Buenos Aires.

It is with considerable pleasure that I send to you my congratulations on the occasion of the centenary of your magazine. THE RAILWAY GAZETTE circulates amongst the senior staff of this company, and its articles are always both interesting and informative, and also very useful for reference purposes. You have my wishes for its continued success.

The features of the paper which occupy my attention mostly are naturally those dealing with the accounting systems and the compilation of statistics.

Mr. T. C. Hales, V.D., Divisional Superintendent, North Western Railway, Karachi.

THE RAILWAY GAZETTE invariably receives a warm welcome here, as it brings us news, with copious illustrations, of the railways of the world. Its notes on permanent way are frequently very interesting, while its general get-up leaves nothing to be desired. The GAZETTE has our best wishes for a career of ever-increasing interest and usefulness.

Mr. E. R. Hondelink, Consulting Engineer, Kobe, Japan.

I have always read with interest every issue of THE RAILWAY GAZETTE since I started as a regular reader in the early years of my railway career, and the 40 half-yearly volumes I have now on file have been a source of valuable information on a great many occasions in my work for railways in various parts of the world. In my opinion every feature in the paper is of interest to some department, and with the recent inclusion of *The Railway Engineer's* technical features I cannot think of any useful addition or improvement.

Mr. W. H. Burnand, Chief Operating Superintendent, East Indian Railway, Calcutta.

I write to express my appreciation of the valuable assistance THE RAILWAY GAZETTE has rendered to railwaymen in general. The technical articles and interesting notes on improvements and new developments have been of great assistance to my department.

As a journal for promoting the interests of railways in general the GAZETTE has certainly lived up to a very high standard, and I congratulate the journal on completing its centenary.

Mr. Robley Freeman Sopris, Berwick, Pennsylvania.

Your first hundred years justify the belief and hope that you will be with us for many more. Every part of your journal is read with interest, editorials no less than the rest, and I find the *Diesel Traction Supplements* of particular usefulness. I have wondered whether or not the supplement title and contents might be changed to rescue the petrol and steam-powered railcars from the present rather neglected state. Though a firm believer in the "chosen future" for diesels, I like to see the whole field covered.

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RAILWAY MAINTENANCE PROBLEMS, VI.—PERMANENT WAY

By Lt.-Col. H. A. HULL, M.Inst.C.E., District Engineer, Northampton, L.N.W.R. & L.M.S.R., 1918-33

Notwithstanding all the knowledge now available in print, some of the most essential and elementary facts are often ignored. There are always pioneers at work, on whose heels follow those with ingenious minds to record their results as formulæ for the future guidance of the unimaginative or timid.

CONSIDERING the vital importance of permanent way to a railway it is surprising how little attention this factor claims from the public. Indeed, even by other departments of the railway itself, difficulties are sometimes raised in connection with the granting of facilities required for maintenance purposes through nothing more than lack of understanding on their part. Although the metals would be of no commercial use without the traffic to run upon them, yet it might be borne in mind that their absolute continuity is a vital necessity and the hiatus of even a foot would dislocate the most elaborate traffic working. The moral of this is that each department of a railway should try to appreciate the importance of the work of the others.

It is of paramount importance that the materials composing the permanent way, besides being sound and reliable for the immediate purpose, should also be capable of lasting for as many years as possible in their original situation. A regular top is essential for smooth running, although it does not necessarily follow that slight irregularities are a source of danger. The alignment must be laid and always maintained true, and finally the ballast must be kept clean and the drainage efficient.

The best means of assuring the foregoing is suitable man power, both as regards quality and strength, and over all there must be close and constant supervision. Besides travelling over the line as frequently as possible, the author found it good practice, in order to obtain uniformity in the various duties concerned with the maintenance of the road, to hold a monthly meeting of his Chief and District Permanent Way Inspectors. At these meetings all questions affecting the permanent way were discussed and minutes were kept.

The road must have constant attention by skilled men. A good ganger or platelayer is not made in a day, and the modern tendency to reduce the length gangs to a bare minimum and take on temporary untrained labour for special work, or to reinforce the attenuated length gangs when their work has become too much for them, sooner or later reacts upon the well-being of the permanent way. When the necessity for economy arises the permanent way should not be the first upon which the blow falls, or the cost in the long run may be excessive.

That an even top is not regarded by all engineers as of equally great importance was brought home to the author when, at the time of the amalgamations, he took over the maintenance of certain lines outside his original district on which he found many sections with dipped joints. These sections had been maintained with an ample number of men per mile by beater packing. The men in charge assumed that nothing could be done to cure the dipped joints, regarding them as a matter of course. The author, however, having been brought up on the practice of shovel packing, decided to institute this method of maintenance on his new sections. The District Inspectors and then the gangers were duly instructed in the method and, at an appointed date, all the beaters were withdrawn and shovel packing instituted. The results were most satisfactory and within a year there was a distinct improvement in the top and the dip at the joints had disappeared. Once used to the new method the gangers, without any exception, declared that they would not like to revert to beater packing, for, besides being able to maintain a better top, they could do so with less strain.

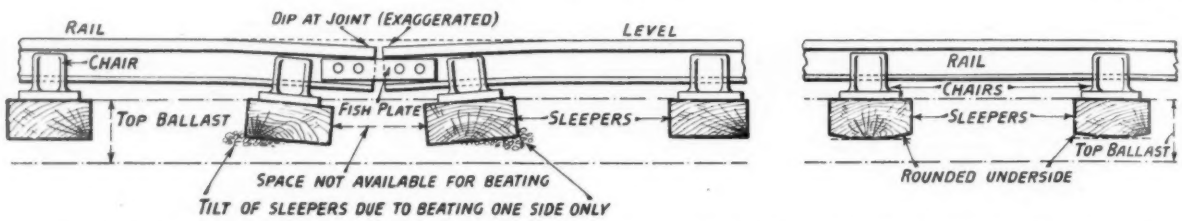

Fig. 1 (left)—Sectional elevation of road, showing dip joints; and Fig. 2 (right)—Section of sleepers, showing rounding of underside due to beater packing

The cause of the dipped joints was doubtless attributable to the close proximity of the joint sleepers preventing their being packed with the beater from both sides. The packing being driven always from one side, the sleeper became slightly tilted, as indicated in Fig. 1. With shovel packing it was possible to overcome this. There is no doubt, also, that where much fettling is required and beater packing is used, the underside of the sleeper in the course of time becomes rounded, as shown in Fig. 2. This prevents the sleeper standing firmly upon its bed and contributes to irregularities of the top.

The lines incorporated in the author's district, being deficient in ballast had to be lifted two or three inches on fresh ballast, and the opportunity was taken to use ballast of a size more suitable for shovel packing than the original material, which was rather large. The advocates of large top ballast sometimes maintain that better drainage is obtainable than if the ballast is small. While there may be some truth in this when the ballast is new and clean, yet the causes of inefficient drainage are common to both large and small ballast. The ballast must be cleaned from time to time, and the small ballast is much easier to deal with when doing so. The author found that with the ordinary strength of a length gang it was possible to riddle the ballast once in ten years, which was sufficiently often for all practical purposes. Riddling by two men, one shovelling and the other shaking a circular shallow hand riddle, proved the most expeditious and economical method of many that were tried. Neglect to keep the ballast clean inevitably told its tale on the condition of the road.

The temptation with the novice in shovel packing is to pack excessively, and this tends to emphasise any hollowness in the adjoining sleepers and even to cause hollowness where there was none before. Close observation on the ground shows that on an average only two or three of the sleepers in each rail length are tight down on their bed, the intervening ones hanging slightly and taking their bearing only under the load of passing trains. Knowing this the experienced ganger will, when a new road has been laid or an old one renewed, concentrate on certain sleepers equally spaced in each rail length, and will afterwards aim at bringing the intermediate sleepers up to the proper height.

Although the smoothest running can be obtained only when the track has a regular top and true alignment, yet modern bogie rolling stock, when well maintained, will run fairly smoothly even over an irregular track. The most potent cause of rough running is irregularity of cant on curves.

Relaying

The chief causes in the depreciation of the materials comprising the permanent way are plainly indicated in the periodical relaying reports of the District Engineer. The relative importance of the causes that contribute to the necessity for relaying are found to be as follows:—

(1) Sleepers split, chair-galled and beginning to decay, and fastenings becoming loose and worn.
(2) Sleepers chair galled and fastenings becoming loose and worn.
(3) Rails knocked down at the running-on end.
(4) Rails side cut.
(5) Rails getting light.
(6) Rails roaring.

(1) This is an indication that the road is approaching the limit of its life and should be relayed completely in the near future. The life of the wooden sleeper does not necessarily synchronise with that of the rail, but the advent of a suitable steel sleeper may make this possible. The sleepers generally used in this country are of creosoted Baltic fir, and in the author's district there were instances on branch lines where sleepers remained in their original position for 40 years, and when taken out were found even then to be still sound enough to be used for other purposes. These sleepers were obviously of slow-grown timber, well seasoned, and the fact that they were still black when taken out of the running road indicated that they had been well creosoted.

The average life of a well seasoned and creosoted sleeper, with its fastenings, in a main line may, however, be taken as 20 years. After that time the sleepers may be found fit to be used again for repairs to running lines or for sidings, or, if not in good enough condition, they may be sawn up for fencing or firewood. Approximately 15 per cent. can be used again in the running lines, 35 per cent. in sidings, 40 per cent. for fencing and 10 per cent. for firewood.

The best type of fastening in the author's experience is the galvanised coach screw, there being less spreading of the gauge with this than with the wooden trenails or iron spikes formerly used.

The author had a trial length of a quarter of a mile of dish-cover type steel sleepers which were laid on the ballast in exactly the same way as ordinary wooden sleepers when a certain length of road was being renewed. They were maintained by shovel packing, also in exactly the same way as wooden sleepers. After several years in the road, it is still not possible to detect their presence from any audible indication when travelling over them at speed. The top and alignment of the track is as good with these steel sleepers as with the adjoining lengths of wooden sleepers. The writer's experience of steel sleepers put down for trial in 1887 on a branch line in open country with gravel ballast indicates that the steel sleeper has, owing to corrosion, a shorter life than the wooden sleeper, but this may have been due to the particular type of sleeper.

(2) The extent of indentation of the sleepers by the chairs, or chair-galling, depends largely upon the size and shape of the base of the chair. At Newbold water troughs, just north of Rugby on the Trent Valley line, the author's predecessor had used large joint chairs on all sleepers at the running-off end of the troughs where, of course, there was much water splash. Although these sleepers had to be renewed on account of their becoming thin due to the friction of the ballast on their undersides, aggravated by the action of water, yet there was no evidence at all of any chair-galling on the top (felt pads had not been used). The chairs in question were 10 in. broad and exactly covered the width of the sleeper.

(3) Close observation of the road during the passage of a slow train shows that there is a minute yielding under the load, a few of the sleepers remaining rigid whilst the intervening ones give slightly. Besides this there is a definite deflection of the rail itself between each chair, so that the wheels of the vehicles travel over a miniature switchback, to which nothing comparable is found on an ordinary macadam road surface. If the sleepers are evenly spaced throughout, this deflection by the reaction at the chairs forms a regular wave; but if the spacing of the sleepers is appreciably different at the joints there is a corresponding alteration of the wave length, the altered pitch causing the wheels to leap (in a way comparable to a diver running up a spring board), with the result that the wheels alight with a bounding action several inches beyond the running-on end of the rail. Thus, instead of the butt end of that rail becoming the most worn, the largest wear occurs some distance ahead and will eventually cripple the rail. This matter deserves careful attention, since the pounding of the rails, as described above, directly necessitates much of the relaying.

It is doubtful whether the present tendency towards shorter joint bearings and fishplates will eventually prove so satisfactory as the use of longer, well fitted fishplates to ensure the continuity of the strength of the rail, and with the joint sleepers spaced uniformly with the intermediate sleepers so as to avoid the jump described above.

(4) Side cutting has been put in the fourth category by the author as the result of experience on his original district, where the curves were for the most part flat and the road maintained by shovel packing. On the sections taken over at the time of the amalgamations, it was found, however, that although the rails were of an abnormally heavy section, side cutting was prevalent on flat curves, and even, in places, on the straight. A considerable amount of relaying had to be undertaken for this reason alone, despite the fact that otherwise the track might have lasted for many more years.

Faulty maintenance, resulting in uneven bearing and consequent variations in level, both on the straight and on curves, under the passage of trains, was probably responsible for this side cutting. It was certainly not due to insufficient cant on curves, as the following instance will show. Fig. 3 is the diagram of a junction showing what part of the curved track is superelevated, and what part cannot be superelevated owing to the junction itself. It was found that side cutting was just as great on the superelevated line beyond the junction as it was through the junction itself, despite the fact that the speed restriction and the radius of the curve were uniform throughout.

(5) Apart from side cutting, the cause of rails getting light is the direct wear of traffic, and the frequency and

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weight thereof, as well as deterioration due to atmospheric conditions. A certain amount of rail changing may be required where excessive wear occurs locally due to the slipping of driving wheels. On branch lines, where the traffic is light, the rails may stand resleepering, but on main lines carrying heavy traffic it is usual to relay entirely with new materials, and to re-use the rails, if they are serviceable, on branch lines or in sidings. Rails to be so re-used should be numbered in sequence at their ends when they are taken out, so that when they are relayed elsewhere they will track properly and enable a good top to be obtained.

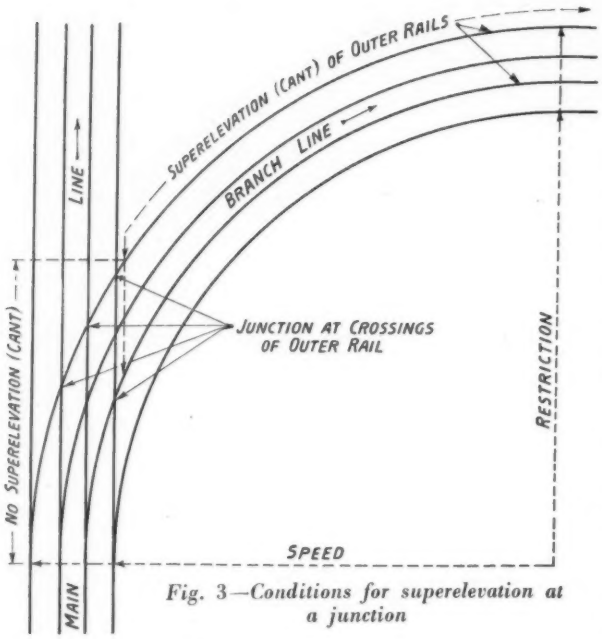


Fig. 3—Conditions for superelevation at a junction

(6) So far as the author is aware there is no satisfactory explanation of roaring rails, but it is occasionally responsible for the necessity to relay.

The information required in compiling the relaying report emanates first from the ganger and is revised by his District Inspector, who then passes it through the Chief Permanent Way Inspector to the District Engineer, who finally makes a detailed inspection on the ground. This takes place usually about two years before the actual relaying operation is due, the lapse of time being taken into due consideration, of course.

The author's considerable experience of permanent way maintenance has convinced him that the simpler the work is kept, and the less cumbersome the machines employed, the more economically and safely can the work be performed. Well trained gangs of men are the most potent factor in achieving economy.

(We hope to publish the next article in this series in our issue dated July 5. Previous articles appeared in our January 18, February 15, March 15, April 12, and May 10 issues.)

THE FUTURE OF THE STEAM LOCOMOTIVE

"WILL changes in motive power revolutionise the railroads?" This question was asked by Mr. G. W. Alcock, of the Lima Locomotive Works, Inc., in the *Iron Age* for April 4, and answered in that journal for April 11. He concluded that the displacement of steam power by oil-electric power would be restricted and specialised rather than sweeping. It was suggested that the light-weight diesel engine had its inception in Germany, but that its development for transportation occurred mainly in Great Britain where the difference in the taxes on petrol and heavy oil—merely this and nothing else—provided the incentive. The oil engine was stated to be not particularly well fitted for railway duties, and speed-tractive effort curves of oil-electric and steam locomotives showed that, while the tractive effort was higher at low speeds for the oil-electric, it fell much below that for the steam engine at speeds in excess of 3 to 4 m.p.h. The curves for the oil-electric locomotive were roughly hyperbolic, and indicative of an almost constant drawbar h.p., whereas those for the steam locomotive showed the characteristic inability of this type of engine to develop much power at low speeds. The author's argument against the diesel unit was based on the supposition that a drooping effort curve was a fatal defect of oil-electric power. He suggests that the diesel shunter would be inferior to the steam shunter if the speed range were between 3 and 9 m.p.h., and that the drooping effort characteristic of the diesel-electric locomotive might prevent it from accelerating trains with sufficient rapidity, despite a good start from terminals. It was suggested that the inherent feebleness of the diesel-electric had led designers to reduce the weight and strength of diesel trains below the limits which railway engineers considered essential.

Some valid criticisms of the proposal to adopt diesels everywhere followed those just summarised. It was pointed out that a custom of railways was to work branch-line freight and light passenger services with old engines which had outlived their period of usefulness in the work for which they had been built. When diesels were substituted and savings were shown, the steam locomotive was decried as wasteful and obsolete, yet, for the comparison to be a fair one, it was obviously desirable that the steam engine should be a modern one and not one from 20 to 40 years old. Again, the reduction of standby losses achieved by diesels could be secured at less cost by increasing the utilisation of steam locomotives. It was a matter of organisation, and would have the added advantage that it would work off the potential mileage of the locomotive over a shorter life, permitting its retirement at an earlier date and ensuring to the railway a new unit which would take advantage of improvements in the state of the art. Regarding the saving in fuel cost, the author pointed out that it was offset by increased lubricating oil costs. Also, if the old law of supply and demand still obtained, the cost of fuel oil would increase with any appreciable increase in the number of diesel units. Against any saving in fuel cost there would have to be offset the much greater first cost, and the additional interest on the investment. A steam locomotive of 6,000 d.b.h.p. could be built for not more than $150,000, whereas the equivalent diesel unit would cost about $600,000 if present prices were any guide. Moreover, the diesel was heavier than the steam unit of the same power—due chiefly to the addition of 42 lb. per h.p. for electric transmission equipment to the 20 lb. per h.p. for the diesel engine itself—and it was questionable if a 6,000 h.p. unit could be built within the limits imposed by railway service. In the second part of his article the author described the German high speed steam locomotive experiments, and gave illustrations of these from THE RAILWAY GAZETTE.

NEW RUSSIAN STANDARD RAIL

ALMOST the first problem confronting the U.S.S.R. railway authorities in carrying out the grandiose scheme of transport reorganisation proposed by the second Five-Year Plan was the introduction of a rail suitable for axle loads up to 25 tonnes. After a full consideration of practice in Europe and America, taken in conjunction with Russian experience, the desideratum was somewhat modified, and an entirely new rail section evolved, which, although weighing only 91·5 lb. a yd. (45·3 kg. a metre), is now being used under 23-tonne axle loads.

Viewed according to existing and prospective traffic, the railway system of the U.S.S.R. was divided by the People's Commissariat for Transport into three categories, the tracks of which were to meet the following requirements:—

Class I .. 25-tonne axle load.
Class II .. Standard 0-10-0 loco with 18-tonne axle load and a possible future increase to 20 tonnes.
Class III .. 2-6-2, 4-6-2, and 4-8-0 locos with axle loads up to 18 tonnes.

For over two years a rail weighing 88 lb. a yd. (43·6 kg. a metre) has been used on certain Class I lines, but as less than 2 per cent. of the total mileage is laid with this section it cannot be regarded as a standard. The heaviest rail which could hitherto be regarded as a standard on the Soviet system scales 78 lb. a yd. (38·6 kg. a metre), and according to certain calculations it was believed that this rail could carry axle loads of 20 tonnes if the sleeper spacing was reduced to 21·5 in. (55 cm.).

After making numerous theoretical investigations, in the course of which it was found that, for Russian conditions, the maximum axle load in tonnes which could be carried was roughly equal to half the weight of the rail in kg. a metre, a new rail weighing 101 lb. a yd. (50 kg. a metre) and suitable for axle loads up to 27 tonnes, was designed under the direction of Ing. B. N. Sergeiev. In 1931 this design was proposed as the Standard for Class I railways, but as the necessity of a 27-tonne axle load was not pressing, this section was never rolled. The design is still available for future use, and its proportions are shown in Fig. 1.

To meet the requirements of a 23-tonne axle load, the Central Institute of Scientific Research got out the design shown in Fig. 2, and this was adopted definitely as the standard and is now in extensive use. The main point of difference between this rail and the types previously in use are the curved instead of straight contour of the web, and a straight incline of 1 in 4 on top of the flange and beneath the head, in place of two or three different tapers. The continuous slope of the top of the flange is of advantage from the point of view of rolling, and also metallurgically because of the equalisation of the amount of metal in the head and flange of the rail. By adopting a section with a continuous slope, it was found possible to reduce slightly the thickness of the flange, and as the slopes of the flange and the underside of the head are the same, the design of the fishplates is simplified.

When the design was being evolved, consideration was given to certain German claims that the use of a head wider at the bottom than at the top (a feature incorporated in the design of the 101 lb. rail) would result in less wear, owing to the greater area of contact between the rail and the flanges of the wheels. The Russian engineers, however, held that this was true only in the case of static load, and that where dynamic loads were the important factor, as they are in railway practice, the increased area gave greater slippage. In support of this it is stated that in North America the least wear has been experienced with rails having the underside of the head cut away. In such proportions as the relation of the flange width to the height of the rail, the new standard section does not differ markedly from modern practice throughout the world.

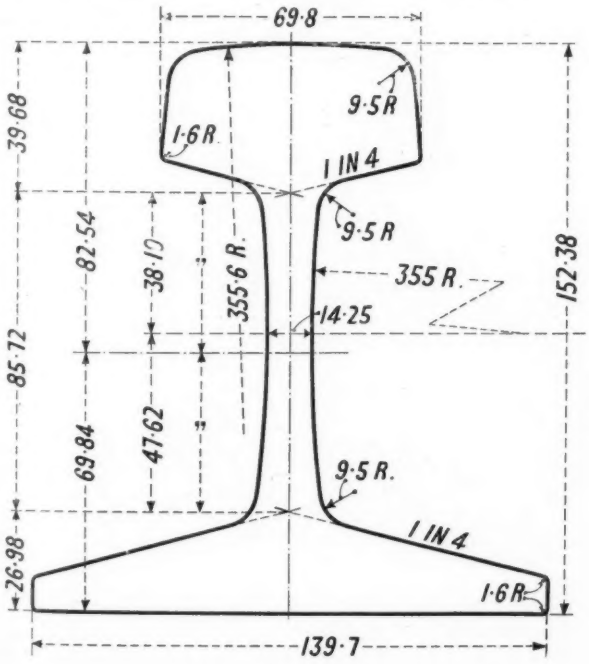


Fig. 1

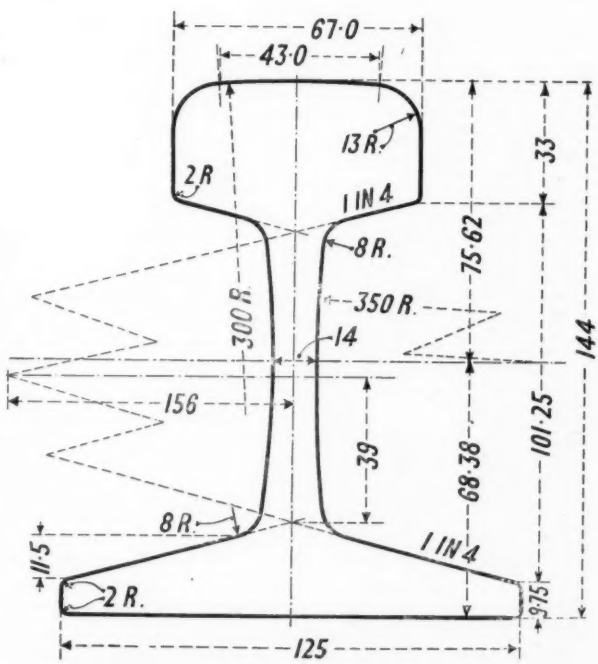


Fig. 2

COAL SELECTION FOR LOCOMOTIVE WORK

By C. S. DARLING, Whit.Ex. Dipl. Eng.

RAILWAYS are among the most important groups of coal users, and the present revival of interest in the application of coal and its merits, as against other fuels, has its reflection in the railway purchasing departments. Improved and systematic methods of comparing fuels should be adopted, and it should be remembered that while coal-burning appliances for locomotive work do not possess the refinements which enable stationary plant to burn the so-called " lower grade " fuels, yet the design can and should be such as to enable the most economical fuels local to the line to be used to the fullest extent.

Coal from each mine which tenders for coal supply should be examined, and both face and truck load samples taken. These should be analysed for the usual characteristics, *i.e.*, moisture, ash, fixed carbon, volatile, sulphur and calorific value in the received condition, the air dried condition, and also reduced to a common standard of moisture content. The last is important in locomotive work, since it is not the ash and moisture free value which should be considered, but the ash free and standard moisture value which is the comparative figure, since the fuel must of necessity be subject to assimilation of moisture varying from season to season. This is important in many countries, especially those subject to tropical conditions, when the moisture contents may rise from 5 to 25 per cent.

Principles of Fuel Selection

In selecting fuels for the hard work of locomotive haulage, the B.Th.U. value alone has not the same importance as in fuel to be used in plants where it will be treated prior to firing, such as pulverising plants. Coals should therefore be compared for physical and analytical reasons on each of the following counts:—

(A) First quality physically.—Firm structure over long period of storage and with normal handling.
(B) Second quality physically.—Systems of mining and preparation, &c., need care.
(C) Finable structure.—Fines tend to increase with storage and handling to excessive proportion.
(D) Mining methods and preparation satisfactory.
(E) Good-quality fuel, but natural conditions prevent satisfactory preparation.
(1) Best coal chemically.—Low ash and sulphur contents.
(2) Good coal chemically.—Preparation requires care.
(3) Fair coal chemically.—Preparation requires special care.
(4) Not satisfactory chemically.
(5) Unsuitable chemically.

Each coal considered can then be given a reference combination from the preceding table; thus, a good coal would be A.1, and the most unsuitable would be E.5, while B.2 would be a good coal requiring care in use and checking on delivery.

The ordinary commercial coal purchaser is guided in choice by the B.Th.U. per penny, or the lb. of water evaporated per lb. of fuel, and per unit of cost. With a railway it is very difficult to check the evaporation per lb. of fuel, since the auxiliary duties of the locomotive vary from zero to 100 per cent. of the duties at any instant, and what is more important the lb. of fuel per 1,000 lb. drawbar pull will vary with the type of load, the nature of the run, and the conditions of speed, climatic conditions and the nature of signal checks.

Other factors, also, are present to influence the choice of a railway in its fuel supply and choice. While a railway is often fortunate in its situation near a colliery, in which case the freight on its purchased coal can be put down as an out-of-pocket loss to suit the nature of working costs, where a company purchases coal shipped over a foreign line, even in its own trucks, then the normal rate must be borne and paid in cash on the foreign line. Thus it may be cheaper to buy an inferior coal from the company's own area of traffic than to obtain better coal over other lines. This will, of course, be largely settled by the question of reliability of supply, by the expected area and development of the local deposits, and by the fact that the coal may be in value anywhere between class A and E, and (1) and (5). Continuity of delivery, availability of empty coal wagons, return loading for empty trucks, the governing direction of heavy and empty wagons, must all be weighed with the characteristics of the coals.

Coal for Heating Diesel Trains

The major developments in the use of diesel engines have so far been the increasing use of high speed trains, of relatively low power, for branch line and feeder lines. In certain cases on the Continent, these have been so successful that high-power units have been constructed, and it is in the practical working of such branch units that the difficulties about to be described have arisen.

To reduce the running and capital costs attending the application of these vehicles, it is proposed to ignore the old system of shedding at night, and to leave the vehicle complete (*i.e.*, coaches and power units) in the station sidings, which means that, in the winter, heating over night, so as to produce comfortable conditions for morning travel, must be resorted to. It has been considered in certain quarters that, contrary to popular opinion, solid fuels are preferable for the duty of supplying the necessary heat.

The objections to oil are many, and include the following :—
Automatic firing mechanism liable to fall out of adjustment due to vibration.
Risk of fire due to leaky joints, also caused by vibration.
Odour of oil passing to passenger quarters, and necessity for skilled attendance; heat from boiler passing to confined spaces accentuates this.

Diesel trains with electrical transmission can have electrical heating from storage accumulators, but when the oil engine power unit is required, from reasons of economy, to haul standard steam heated coaches, electrical heating must give place to other cheaper and more flexible means. Continental practice in this respect is a good guide, since the problem of train heating in Northern Europe, Switzerland, and other districts, is more intense than in the temperate climate of this island. In order, therefore, that the new system of prime mover shall gain a sound footing on British railways, it is interesting to note that it has to utilise the fuel with which it is apparently competing, especially when economies of operation force the use of oil engine units to the haulage of standard steam stock.

The writer uses the phrase " apparently competing " since it is probable that the future of the oil engine in this country is bound up with the development of processes for the extraction of oil from coal, a subject which has attracted attention in the past, and has now attained to the practical, if not to the commercial profit-making stage.

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Road and Rail in New Zealand

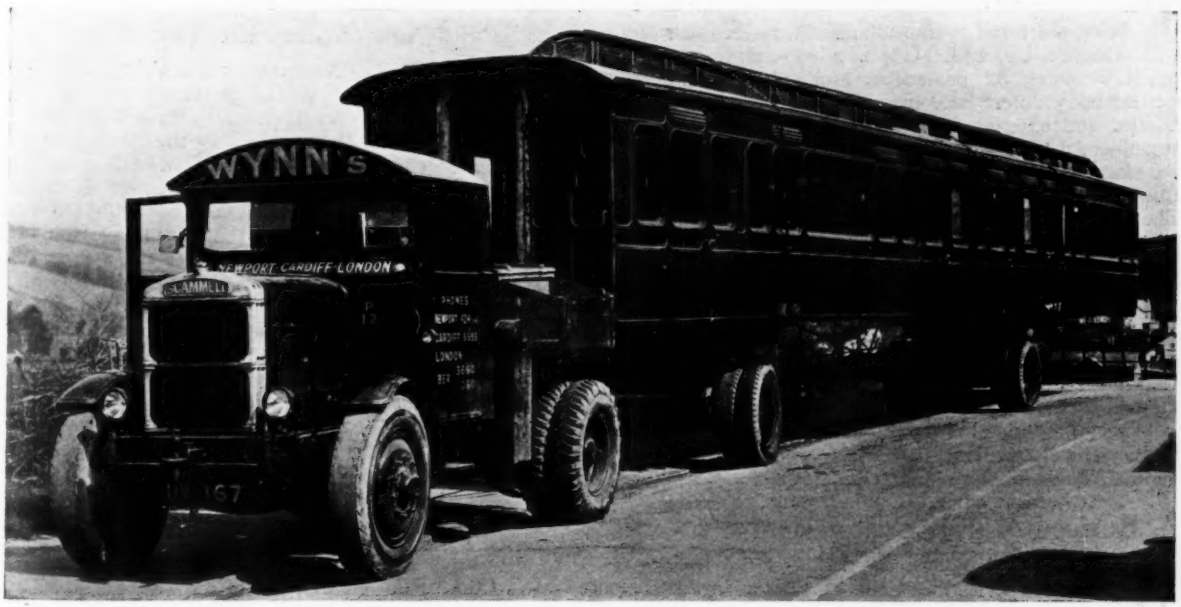
THE efforts to secure a practical measure of co-ordination between road and rail traffic in New Zealand do not seem to be bearing much fruit. At the beginning of this year the Auckland Licensing Authority approved only three out of 29 applications for licences between Auckland and various country centres. Thirteen others were limited to certain areas and thirteen others were refused. That was described as something of a bombshell to road transport operators, and now the Transport Co-ordination Board has caused consternation in railway and official circles by reversing the decision. The board has pointed out that the principles of the Act call for the placing of existing services under control and regulation and the prevention of new services being started except under licence obtained after proof of necessity or desirability. It adds that there may be cases where the control may require prohibition but they are exceptional and must be closely examined before such a decision is reached. "The board," it says, "has always held the view that one of its most important duties is to ensure that the public is provided with the cheapest and most efficient form of transportation. It necessarily involves a consideration of the position of the State-owned railway system. The Government railways are entitled to such consideration and protection as is comparable with the service they are rendering to the public. We can find nothing in the Act which gives the railways any claims to special protection or consideration."

Control, Not Prohibition

THE board go on to express the opinion that the wholesale elimination of services would involve considerable unemployment and thereby bring about a most undesirable situation. The licensing authority had stated that road services competed unfairly with other forms of transport in that they did not bear the proper proportion of road costs. To that the board replies that the adjustment of the economic basis of competition from the point of view of taxation is purely a matter for the legislature. Unnecessary road usage can be adjusted largely by regulation of road services and particularly by effective co-ordination. Perhaps that is a hint of the possibility of increased taxation on road vehicles, and although the Transport Co-ordination Board is the supreme authority under Parliament it is unlikely that the matter will be allowed to rest where it is now, remembering the Government's investment of over £50 million in railways.

Motor Services in South Africa

IN spite of severe competition in some places the road motor services run by the South African Railways and Harbours continue to grow. At the end of last year the route mileage was 10,834 and at the end of April another 64 miles had been added. During 1934 new services to the extent of 445 route miles were added while others aggregating 110 miles had to be withdrawn owing to the loss entailed or the lack of support. It is gratifying



The End of a Royal Career. One of the saloons of the G.W.R. Royal train being towed by a Scammell lorry on the last stage of its journey to Aberporth on the Cardiganshire coast where it is to end its days as a bungalow. The Royal train of which this formed part was used on the occasion of Queen Victoria's funeral, when it is believed that it carried more crowned heads than have ever been gathered in one place simultaneously

to hear that owing to increasing demand it has been necessary to increase the carrying capacity of the buses employed in the Kuruman area, on the Cape Northern System, the work of reconstruction being carried out in the repair shops at Kimberley. In the Orange Free State the road services had a record year. In eleven months 345,833 bags of wheat were conveyed whereas the previous highest total in a whole year was 276,346 bags in 1931-2. In addition 600,481 bags of maize were transported and the cream conveyed showed an increase of 50 per cent. Departmental lorries are engaged in taking some 200 tons of heavy bridge material from Zastron station to Mayaputi, a distance of 21 miles. Incidentally, it is interesting to note that there is a continued heavy demand for petrol in the Western Transvaal; in a recent week seven fast petrol trains conveying 552,000 gallons—approximately twice the quantity conveyed in the corresponding week of the previous year—were run from Lourenco Marques to Reef stations. The latest information available for the whole of the Road Motor Services relates to the month of February and shows that the vehicle miles totalled 425,553, the tonnage conveyed was 40,566, as well as 125,635 gallons of cream and 171,218 passengers, all these figures showing a substantial advance over those for the February of the previous year. The revenue was £40,442 while the expenditure was only £36,018

Railway Interests in Motor Coach Pools

IN the paper read by Mr. W. Noel Jackson before the Omnibus Society, to which reference was made in our issue of April 12 last, some changes were foreshadowed in connection with what is termed the Blackpool-London pool in which the L.M.S.R., the G.W.R., and the L.N.E.R. were interested through holdings in Ribble Motor Services Limited, the Birmingham and Midland Motor Omnibus Co. Ltd., and the North Western Road Car Co. Ltd., which controlled the three operators concerned, namely, W. C. Standerwick Limited, Joseph Bracewell Limited, and Wood Bros. (Blackpool) Ltd. As experience has shown that the majority of the traffic is of a through character, the whole of the shareholdings in the operating companies have been transferred to the Ribble concern so that the L.M.S.R. is the only railway now interested in the Blackpool-London pool. Furthermore, this has enabled the Ribble company to transfer various recently-acquired coaching interests in Lancashire and Yorkshire to Standerwick, which thus becomes the main Ribble coaching subsidiary.

Leyland Coaches for Scotland

TWO new types of Leyland passenger vehicles are now being delivered to subsidiaries of the Scottish Motor Traction Co. Ltd. One is a two-axled, oil-engined coach to carry 32 passengers and, although the steel framed body differs little from the service bus design, the interior and exterior finish is different, noticeably in the arrangement of the windows which, while giving the appearance of considerable size, are not subject to the troubles sometimes associated with large glazed areas. The external colour scheme is black and white with gold lettering, and a distinctive note is struck by the polished green metal radiator which takes the place of the usual aluminium style. The interior equipment includes a Clayton heater and the seats and front bulkhead are finished in dark moquette. Thirty vehicles of this type are being built to the order of the S.M.T. Western Group. For the Central Group, Leyland Motors Limited is building steel framed bodies for 39 passengers, all of whom face forward, with the exception of one seat over the near side rear wheel arch. The chassis is the new three-axled Leyland Tiger, the rear bogie having one driving and one driven axle.

A Revised Morris-Commercial "Leader"

DURING recent months the design of the Morris-Commercial Leader has undergone some revision with the object of improving its range of usefulness in the light of the changes in the taxation and speed limit. It is now presented as a vehicle which comes within the limits of the £30 taxation class, with a speed limit of 30 m.p.h. and it will carry a pay-load of 4 tons. The driving seat is arranged in a normal position behind the engine but ample loading space has been secured by taking every opportunity of saving space under the bonnet without sacrificing anything in the way of accessibility. The power plant is either a four cylinder engine of 3,519 c.c. capacity or a six cylinder one of 3,485 c.c. and the transmission is on the usual lines with open propeller shaft and spiral bevel final drive. There are two wheelbases, one of 9 ft. 9 in., for tipping bodies, and the other of 13 ft. 6 in. In the latter type the propeller shaft is in two portions with a self-aligning bearing mounted on a cross member in the middle. The chassis frame includes substantial flanged cross members and a triangulated scheme of cross bracing which is carried along the side members. A comfortable cab is fitted.

The A.E.C. Mark II Series

BOOKLETS have now been issued by the Associated Equipment Co. Ltd., giving illustrated details of the latest Matador, Monarch, Mammoth Major and Mammoth Major Eight-wheeler, which are designated Mark II. These chassis are lighter than before, the reduction in weight, broadly speaking, having been obtained by the adoption of lighter frames and springs and the use of a redesigned six-cylinder engine and back axle.

New American Types

MANUFACTURERS of passenger vehicles in the United States, striving to secure the utmost seating accommodation, are trying-out a number of novel ideas in the disposition of the engine. In the latest Yellow 32 passenger coach produced by the General Motors Truck Company, the engine is placed transversely at the rear end of the frame, well behind the back axle, to which the drive is transmitted by a shaft, running from what would be the near side of a British vehicle, and arranged at an angle of about 40 degrees to the centre line of the chassis. The driver is seated on the left hand side well forward and an interesting point about the controls is that the gear change lever is quite a small one, the changing of the synchromesh gears being done by pneumatic means. The arrangement of the engine at the back renders it very accessible, especially as the cylinders are tilted backwards. The body construction is of metal, the framework and the understructure carrying the mechanical units being built as a unit of girder design. Special care is taken to seal all the joints of the engine compartment to prevent fumes entering the saloon. In a new coach of similar capacity produced by the White Motor Company, the engine is slung beneath the floor of the saloon.

THE LODEMOR PETROL TRUCK.—It should be noted that in one of the tables in the article on Railway Motor Vehicles for Departmental Work in our issue of April 12, the reference to the Lodemor trucks was, by a printer's error, shown as Rodemore.

German State Motor Roads

Political and economic conditions in modern Germany, where but one fourth of the 50,000 political districts are directly served by rail, have combined to justify an extensive scheme of road construction under the auspices of the Reichsbahn

WORK is proceeding rapidly in Germany on the great network of arterial roads which, devoted specifically to motor traffic, are to permit " unhindered utilisation of the technical possibilities of motor road vehicles in passenger and goods transport." The need for the new roads, their relation to railway transport, and their present and future national significance, formed the subjects of a recent address by Dr.-Ing. F. Todt, General Inspector of German Highways, indicating the far-reaching questions of policy involved.

The basic scheme, prepared with the assistance of the Gesellschaft zur Vorbereitung der Reichsautobahnen (Association for the Planning of the State Motor Roads), shows that the first main network covering the country requires about 6,900 km. (4,289 miles) of roads, of which 1,500 km. (932 miles) were passed for construction prior to August 1, 1934, and other 1,200 km. (746 miles) were included in the autumn programme. It is expected that these 2,700 km. (1,678 miles) will be completed by the end of 1936 and, as shown by the accompanying map (Fig. 1) there will then be open to traffic two north-south connections, and two east-west connections in the north and south respectively. The north-south routes run from the Hanseatic cities via Hanover and Frankfurt-on-Main to Karlsruhe, and from Stettin via Berlin and Leipzig to Munich; while the east-west roads run from the Ruhr via Hanover and Berlin to Frankfurt-on-Oder and Breslau, and from Karlsruhe via Stuttgart and Munich to Reichenhall. The first section, 14 miles, of these new roads was opened on Sunday, May 19. It runs from Frankfurt-on-Main to Darmstadt. A further 16 miles is to be opened this month, and in the autumn it is anticipated that 220 miles will be available for traffic.

Inadequacy of Existing Roads

Prior to the construction of the new motor roads there were about 180,000 km. (111,900 miles) of main roads in Germany apart from those maintained by municipalities, but even of those primarily concerned in through traffic, 25·4 per cent. were narrower than 4·5 m. (14 ft. 9 in.) in 1933, and of the local roads (Kreis- and Bezirksstrassen) 66·5 per cent. were narrower than 4·5 m. (14 ft. 9 in.), barely giving room for two lorries to pass. Only about 30 per cent. of all State and provincial roads were wider

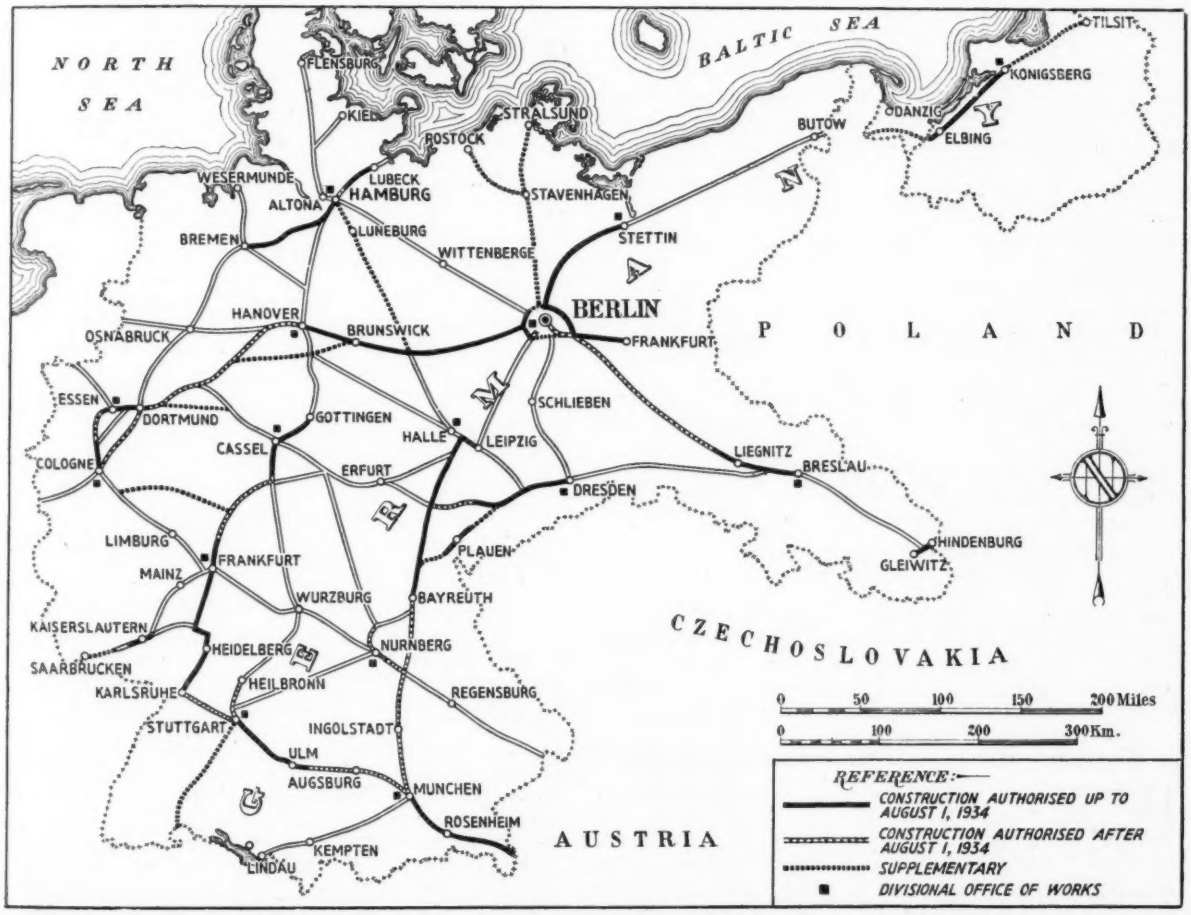


Fig. 1—Sketch map showing the comprehensive proposed new system of German roads to be built in association with the Reichsbahn, indicating sections already authorised for immediate construction

than 5·5 metres (18 ft.), and at the beginning of 1933 about 67 per cent. of all German roads were too narrow for modern motor traffic. Moreover, owing to the former territorial subdivision of the country, the width and method of construction of the roads changed at extraordinarily short intervals.

The inadequacy of the roads was revealed by the fact that inquiry among the competitors in the 2,000 km. (1,243 miles) race of 1933, when all other traffic was kept off the route, elicited the following reasons for speed reduction: curves 23·6 per cent.; pot holes 21·5 per cent.; corrugated surface 20·5 per cent. Apart from defects of location and condition, the roads are normally rendered unfit for motor traffic by the presence of a large volume of horse drawn agricultural traffic.

The growth of motor traffic in Germany is shown by the accompanying chart (Fig. 2). Compared with about 85,000 motor vehicles before the war, there were 212,000 in 1923; 740,000 in 1927; 1,420,000 in 1930; and 1,550,000 in 1933. Later figures are not yet available, but the "motorisation" of the country has proceeded apace during the past eighteen months and it is estimated that the increase in passenger vehicles was about 120,000 during 1934. Even so, Germany has only 1 motor vehicle (private and commercial) per 100 head of population, compared with about 1 per 30 head of population in Great Britain and France. There thus remains enormous scope for further development and the construction of the special motor roads was undertaken in order that this development might proceed unrestricted by the inadequacy and unsuitability of the existing highways.

Rail and Road Transport

From the traffic standpoint, the State motor roads fulfil the technical preliminary conditions essential to full utilisation of the capabilities of motor road vehicles in passenger and goods traffic. The use of lorries on a large scale in Germany began soon after the war with the industrial absorption of thousands of army vehicles. Since then there have been great technical developments, and the claims of road transport to a greater share of traffic are based, says Dr. Todt, on the following grounds:—

(1) Economy of material—the lorry providing 40 h.p. for each tare weight ton of steel, compared with about 4 h.p. in the case of railway traction.

(2) Door-to-door service with maximum simplicity of equipment and organisation. No collecting and delivering agencies are required, little or no transhipment is necessary, and the delay and expense of shunting are avoided. Road transport reduces packing costs, and in the present unsettled state of trade and finance the rapid individual service given by road transport is specially valuable in reducing the necessity for stores of raw materials and finished products.

(3) Freedom of action. There are 50,000 political districts in Germany, only 12,000 of which have railway connections. Road transport serves all, railway transport less than one-fourth. This consideration is of increasing importance, in view of the Government's policy of establishing settlements in thinly populated districts.

Happily, the issue of road transport *versus* rail has given place to rational consideration of the respective spheres of road and railway service, the crucial step being taken when the Führer (Herr Hitler) required the German State Railway Company to interest itself in road transport and ensure systematic associated development of both forms of transport. The purpose of the State motor roads is to allow motor transport to be used effectively and economically in long-distance traffic to the maximum of its technical capabilities complementary to railway transport, without the handicap of excessive repair costs, undue tyre wear, and speed restriction arising from bad surfaces, insufficient width, and other defects. Savings of from 8 to 32 per cent. on the cost of petrol, oil and tyres have been effected by the motor roads of Italy; and American comparisons of three classes of roads have shown that the intermediate class effects 15·8 per cent., and the best 33·6 per cent. reduction in working costs of motor vehicles, compared with the worst class of roads.

The future distribution of traffic between rail and road in Germany has still to be determined and is apparently to be subjected to statutory control. Dr. Todt's remark that lorries are very suitable for special parcels traffic requiring quick delivery is perhaps more than an expression of personal opinion; the goods mentioned in this connection include newspapers, flowers, vegetables, and fruit; also, export consignments which must be rushed to port to catch particular vessels.

Comparisons between road transport costs and railway tariffs affords no indication as to the real economic limits of competition between industrial motor transport and railway transport, because the railway tariffs are agreements determined by many different factors and subject to modification as conditions change. Opinions differ, says Dr. Todt, as to whether private industrial motor traffic can exist alongside the motor traffic of the German State Railway, or whether this class of traffic must be constituted as a monopoly. In the latter event, users would be subject to service regulations and there would be a risk of losing the individuality of service which renders motor road transport attractive.

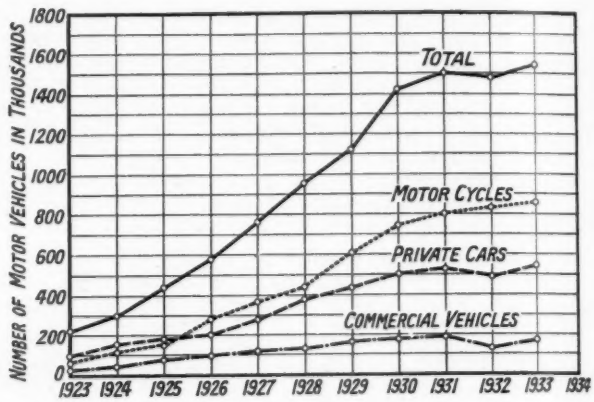


Fig. 2—The recent growth of motor traffic in Germany

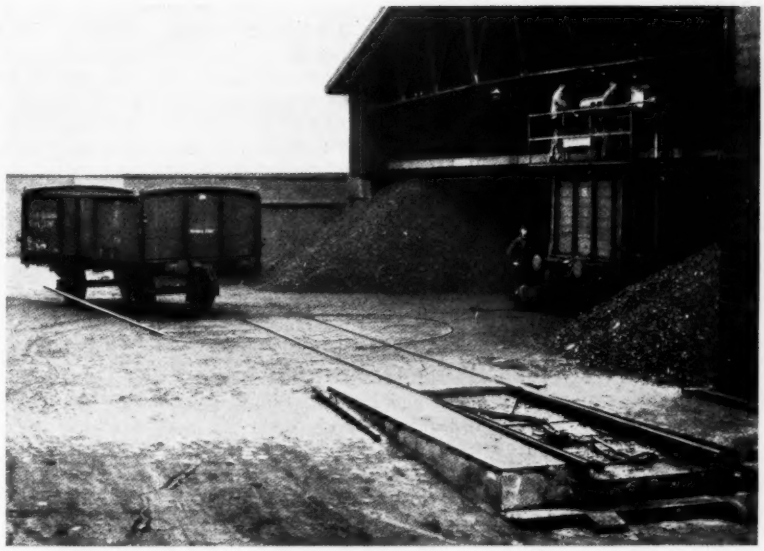
Employment Figures

Apart from their permanent national value in relation to transport, the new motor roads are of great and immediate importance in providing employment well-distributed over the whole country. About 15,000 men were employed on the new roads on April 1, 1934, rising to 66,000 by September 1, 1934, and later reaching about 100,000, which figure is expected to be maintained for 6 or 7 years. Allowing for men engaged in quarrying, bridge building and the supply of materials directly and indirectly associated with the roads, the latter will keep about 250,000 workers employed for six or seven years. The construction of the network of 7,000 km. (4,350 miles) will involve the moving of about 260 million cu. m. (340 million cu. yd.) of earth, and huge quantities of stone, sand, gravel and cement will be delivered to each section for the construction of the roadway. The total expenditure on wages for road-builders and men employed by associated contractors will amount to 2,500 million RM. (about £125,000,000 at par) spread over a period of seven years.

These figures represent only the beginning of the effects of the government's "motorisation" policy. As the new roads become available, the motor vehicle industry will

be greatly expanded. At present only about 2·8 per cent. of the German population depends for its living on motor vehicles, compared with 4 per cent. in England and 10 per cent. in America. Also, the increased use of motor vehicles will involve a corresponding increase in fuel requirements, which are to be met more and more by home-production, processing and refining, thus having a still further beneficial effect on the unemployment problem.

Apart from their material importance in the above-mentioned respects, both during their construction and during their future service, the State motor roads of Germany have an idealistic significance as being not merely the first work put in hand by Herr Hitler, but actually the first great technical project inaugurated in accordance with a plan covering and applied simultaneously to the whole country. Serving as arterial connections through the breadth and length of the land, they aptly symbolise the unity which they effect, and they have attracted attention to the construction of roads solely for motor traffic which may have important consequences in other countries.



In this installation at a German chocolate factory the truck is unloaded from the road-carrier by means of the ramp at the right. The turntable enables one truck to be placed on the lay-bye while another is in the loading bay

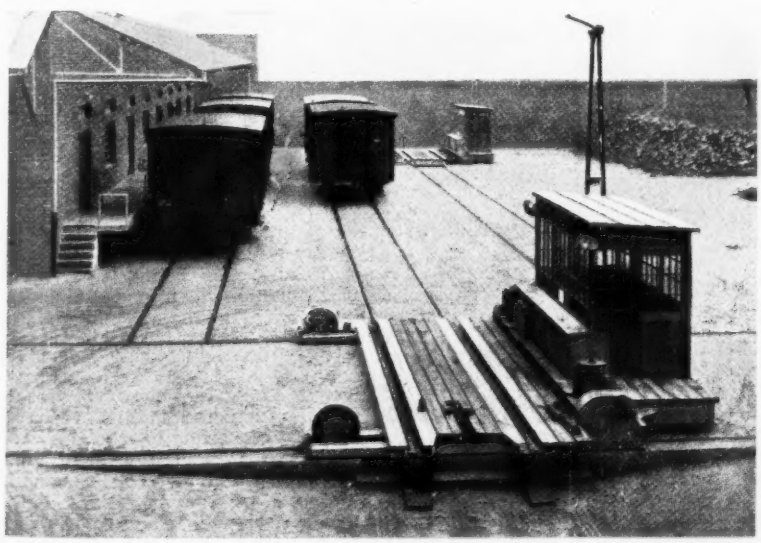
New Facilities by Co-ordinated Administration

Whatever the relative importance attached to the various considerations leading to the construction of the German State Motor Roads, the association of the German State Railway Company with the development of road transport will undoubtedly lead to maximum utilisation of the new roads and to the substantial advantage of the railways themselves. The principle of complete co-ordination between road and rail has been adopted wholeheartedly by the Reichsbahn, as witness, for example, its recent publication of two brochures, one entitled "We serve the State on Road and Rail," the other devoted specifically to the first year's working of the special road trucks which "bring the railway indoors" by carrying loaded railway wagons to and from island sidings or portable standing tracks on customers' premises.*

Without relaxing its efforts to effect yet further acceleration of passenger and goods services by improved steam locomotives, electrification schemes, and the use of railcars, the German State Railway is preparing to establish fast passenger road services as the arterial roads become available. Streamlined diesel coaches seating 19 to 22 passengers are to be used in the first instance, for speeds up to 110 km. (68·4 m.) p.h., and the relative advantages of larger vehicles are to be investigated. Most of the 1,140 lorries ordered by the German State Railway during 1933 were placed in service in 1934, and orders were placed for another 945 vehicles. Trials of 5-ton gas-generator lorries and 10-ton steam vehicles are in progress, and orders have been placed for 500 standardised trailers for 3 or 5 tons useful load.

Except in so far as they serve districts remote from railways, the new passenger and goods road services must be operated to a considerable extent at the expense of rail traffic, but the Culemeyer road truck for railway wagons and other heavy loads represents an important addition to rail facilities and opportunities. In effect it brings the railway to any premises served by road, and it imparts to the railway the advantage of full door-to-door service without re-loading, while retaining the benefits of fast and economical transport by rail for all but the collection and delivery stages of the journey.

The road truck for goods wagons was first demonstrated at the Anhalter goods station, Berlin, on April 27, 1933, and the first public service was inaugurated at Viersen on October 12, 1933. Within twelve months from this date, similar services had been established in five towns,



This shows how railway trucks brought to a works by road can be moved from one short length of rails to another by a traverser

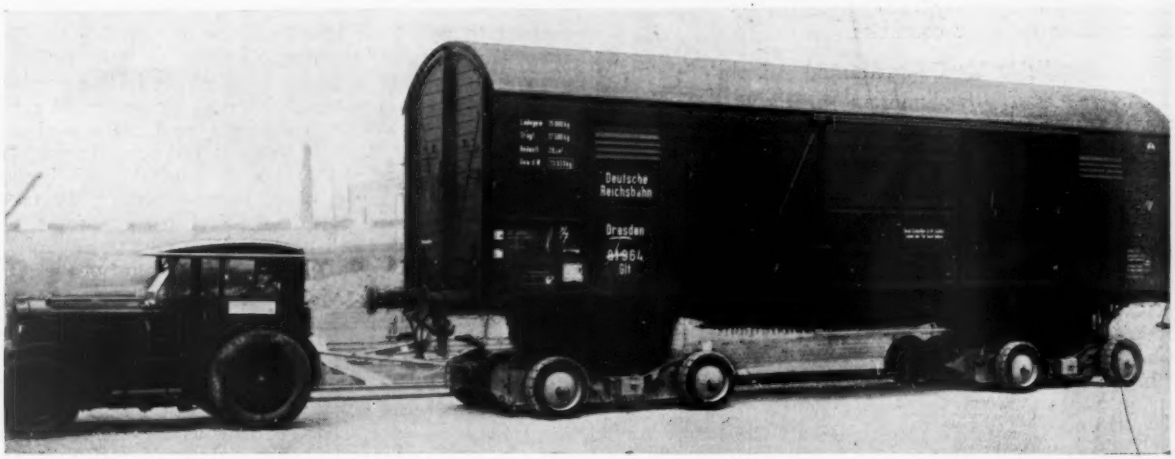
* "Dem Reich wir dienen auf Strassen u. Schienen." 11¾ in. × 8¼ in. 27 pp. Price 28 ff.; and "Die Eisenbahn ins Haus." 11¾ in. × 8¼ in. 84 pp. Price 80 ff.

and more than 6,000 goods wagons had been thus conveyed through the streets, a number which has since risen to more than 10,000. Arrangements are being completed as rapidly as possible in other towns which desire to have such service. Official letters from the highway authorities of towns where the road truck has been in service for periods up to about 12 months, state that no nuisance or damage has been caused.

On the other hand, reports from a variety of industrial concerns express the greatest satisfaction with the road truck service and reveal many advantages in addition to the elimination of re-loading at the railway station. For example, the receipt and dispatch of large and heavy loads such as boilers, paper-drying drums, bridge girders, transformers, and so on, are greatly facilitated; and some manufactures which have hitherto been restricted to coastal or river sites can now be conducted inland without transport difficulties. Fuel oil, molasses, and other viscous materials can be handled more easily and economically, especially in cold weather, by taking tank wagons to the customers' premises and using heating coils as required. Bulk consignments of coal, road metal, or other material can be delivered, at one or more places as desired, straight from a dumping wagon on the road truck.

In some cases, the railway wagon is unloaded from the street or from the consignee's yard without removing it from the road truck or uncoupling the tractor, the truck and wagon being taken back to the railway directly the consignment is unloaded. In other cases, the wagon is transferred to a system of railway tracks on the customer's premises; these tracks are provided with points, turntables or transfer platforms as required and are, in fact, more or less elaborate private sidings connected to the railway by road transport instead of by rail. In yet other cases, and their number is increasing rapidly, the railway wagon is transferred from the road truck to a "portable siding," which is a short line of track on a frame carried by wheels and capable of being lowered to the ground at any desired place. By the use of one or more of these portable sidings, any industrial establishment may have the advantages of private sidings extending to every department without the cost or obstruction of any railway track other than that carrying the wagons actually in use. This facility and a direct connection with the railways are provided by the road truck and roads.

The development of this service is a particularly beneficial phase of the German State Railway's association with road transport, in that it will do much to relieve road congestion while combining the best features of road and rail transport in goods service.



Here is seen one of the German road carriers with a standard 4-wheeled wagon mounted on it. Note the pole which connects the two bogies and transmits the steering control. The construction of the road truck was described and illustrated in "The Railway Gazette" of November 24, 1933

Publications Received

Motor Transport Year Book and Directory, 1934-1935. London: Electrical Press Limited, 16, Fisher Street, W.C.1. 8¾ in. × 5¾ in. × 3 in. 897 pp. Price 30s. net.—It is a splendid testimony to the sound lines upon which this annual volume was first planned that in the latest issue—the nineteenth—it follows the original lines. Some changes have been inevitable, but with them the usefulness of the year book increases. From the tables in the first section of the book it appears that the number of transport undertakings dealt with totals to 7,954 for 1934-35, indicating a shrinkage during the past twelve months, last year's figure having been 8,632. The falling-off is largely in what are termed private firms, which after varying but slightly, between 1,352 and 1,490, in the seven years from 1924 to 1931, suddenly jumped to 5,649, 6,623 and 6,407, and for 1934-35 are shown as 5,798. The recent changes in the law are adequately summarised, and that is a section which many will find most useful in view of the altered regulations affecting goods and passenger vehicles. To others the section giving concise financial and commercial information of the transport undertakings must be invaluable, while the section giving similar information regarding the manufacturing concerns is a useful feature. In brief, the latest volume is as indispensable as those that have preceded it, and it will be assured of a busy and useful life wherever it is available for reference purposes.

The Lightning Plan of London and Suburbs.—To be able to consult a map as easily as referring to a book is most desirable, especially for travellers in a maze of streets like London. One of the latest attempts to meet this demand is the Lightning Plan of London, in which a very clearly drawn map, covering London and its suburbs, is arranged in four sections and folded so that it opens as a book. There is a street guide and cross references enable any street to be located almost instantly. When folded the map measures 10 in. by 6½ in., and it costs 4s. 6d. It is published by the Lightning Cities and Road Map Co. Ltd.

Road and Rail in Australia

A review of the progress made by the states of Australia in allotting the proper functions of road and railway transport

By A. W. ARTHURTON, formerly Secretary, British Railways Press Bureau

ONE of the objects of my visit to Australia was to inquire into the extent of the competition existing between the railways and road transport, and the methods adopted to restrain or regulate it when it becomes uneconomic. There is undoubtedly a wide scope in Australia for road motor vehicles to supplement services which are properly the function of the railways, and in considering the economic aspect of transport proposals involving the possibility of encroaching upon, duplicating or displacing railway revenue earning activities, the Australian people will doubtless remember that they have committed themselves to a capital liability of about £350,000,000 (on which interest has to be paid) in constructing and equipping the railways of the Dominion. This represents such a gigantic liability that the financial position of the railway system constitutes a vital factor in the economic welfare of each State. I was interested, therefore, to see how and with what effect the Governments of the various States had dealt with the situation.

New South Wales had, I found, gone further than most other States in the direction of co-ordination, and had apparently solved the problem of dividing the functions of rail and road. A State Transport Board, set up under the State Transport (Co-ordination) Act of 1931, has plenary powers in regard to the licensing and control of all transport by road, including buses, coaches, tramways, and taxicabs. I had the privilege of discussing the question with Lt.-Col. Bruxner, Minister of Transport, and Mr. S. A. Maddocks, Chief Commissioner for Road Transport, and gathered that the policy adopted by the Road Transport Department aimed at the most economical use in the public interest of the various types of transport available. While this policy has effectively conserved the revenues of the railways, there is evidence that it has not discouraged the use of road transport, as there has, during the past year, been a greater increase in the number of motor lorries registered than in any other class of motor vehicles. There are, in fact, at the present time more motor lorries on the roads in New South Wales than ever before.

By the State Transport Act and subsequent Orders, the conveyance of passengers and goods by road is limited to 50 miles. For distances exceeding 50 miles, 1d. per passenger per mile, and 3d. per ton per mile for goods, based on the aggregate of the weight of the vehicle and the loading it is capable of carrying, have to be paid by the licensed carrier to the State. Applications to operate road motor vehicles beyond the distance of 50 miles in competition with the railways are dealt with on their merits.

One of the Fageol 29-seater motor coaches employed by the Victorian Government Railways Administration for its road services which serve country as well as outer suburban areas

Variations from the maximum charges which can be levied for passengers and goods carried in competition with the railways for journeys exceeding 50 miles are made at the discretion of the Transport Board, and entire exemption from payment is made in special circumstances in respect of goods the transport of which is impracticable or unduly inconvenient by railway, or where the rail route is circuitous and unreasonably longer than the journey by road.

Public passenger vehicles are divided into four classes, *i.e.*, motor omnibuses and service cars, tourist coaches, private hire cars and taxicabs. Each vehicle is licensed to function within its respective class, and conditions of operation are laid down in accordance with the extent to which each class of service is necessary or desirable in the public interest, having regard to the facilities already provided by the Government-owned and other services.

Applications for licences to operate passenger services are declined in those cases where it is apparent that the service would constitute a duplication of existing services conducted in an efficient manner, and where the patronage offering on the proposed route is insufficient to warrant the introduction of an additional service.

So far as interstate operation is concerned, every motor vehicle from Victoria operating in New South Wales is required to be licensed. Very few such vehicles, however, proceed more than 50 miles from the border, and traffic for places outside the radius of 50 miles is usually placed on rail at the nearest practicable station after crossing the boundary. A recent test case in the High Court of Australia in regard to motor lorries registered in Victoria carrying goods across the border to New South Wales for distribution throughout the Riverina districts, upheld the contention of New South Wales that this was an infringement of the N.S.W. Transport Act.

The Transport Board controls the Tramways and Departmental Omnibus services in Sydney and Newcastle, and has authorised the operation of 140 private motorbus services, comprising 288 vehicles, in the Metropolitan Transport District, and 35 services with 53 vehicles in the Newcastle District.

Under the State Transport Act the Road Transport Commissioner is required to exercise a measure of control over air services also, and to require the licensing of any aircraft used for commercial purposes, and several services have already been licensed. The policy of the department is to permit, without restriction, the establishment of air services, provided the aircraft to be used is suitable for the purpose and has been registered and certified by the Commonwealth authorities as airworthy. No charges are imposed in respect of air services operating in competition with railways, but this aspect of the matter will be subject to review from time to time as the circumstances warrant.

Matters have not progressed so far in Victoria as in New South Wales, and road motor competition has hit the railways very badly during the last few years. A Transport Regulation Act, however, came into force on January 1, 1934, in which provision is made for the licensing by a board of the operations of commercial goods and passenger vehicles, except omnibuses, in the Melbourne area and in the urban areas of Ballarat, Bendigo and Geelong. Applications for licences for vehicles operating solely within 25 miles of the General Post Office, Melbourne, in any of the urban districts, or within 20 miles from the place of business of the owner, must be granted without variation. This applies also to vehicles owned and used by a person solely for carrying his own goods, and to vehicles used by a person solely for carrying his own goods, and to vehicles used for a variety of specified purposes, including the conveyance of primary produce.

The Board was appointed on April 18, 1934, and assumed office the following month, but for some time competition for passengers and the higher classes of goods remained very active, with serious adverse effects upon railway revenue. The Victorian Railway Commissioners hope, however, that the result of the working of the new Act will be a substantial amelioration in the near future of the inequitable conditions created by the development of road transport along lines of uneconomic competition, with its attendant adverse influence upon the finances of the State.

At the same time, the railways of Victoria are actively co-operating with road transport wherever such an arrangement is practicable and justifiable. Contracts with dependable road motor operators have been made to provide regular services at fixed fares between the railhead and many of the tourist resorts of the State. In Melbourne and in one of the large provincial centres road motor vehicles operated by the Railway Department are being used with great advantage, and arrangements have also been made for the transfer of less-than-car-loads of freight between the Melbourne terminal and various suburban destinations by the department's own road vehicles.

In Queensland road competition with the State Railways is very keen. The Railway Commissioner, however, has power to put into force, when considered necessary, rates sufficiently low to recover traffic to the railways. He is also chairman of the Road Board and, while taking the necessary steps to conserve the revenues of the railways, he fully realises the advantages of road transport to the community and does nothing to hamper its legitimate development.

In South Australia the policy of the Transport Control Board is co-ordination between the railways and local road carriers, which ensures the latter acting as feeders to the railways. In some cases the local carriers perform the work of delivery to and from railway stations, thus providing a door-to-door transport service. In other cases a co-ordinated form of transport has been arranged with carriers who formerly carried the traffic by road throughout.

Investigations by the Transport Control Board have shown that a number of branch railways which it was suggested might be closed were actually paying their working expenses, and in view of this fact and the strong protests of local residents against the lines being closed, the board decided on a policy, where road and railway interests clash and some road service is necessary, of reserving the heavy traffic such as wool, wheat, superphosphates, &c., to the railway in districts where railway facilities are available at approximately the cost of road transport. It is stated that the activities of the Transport Control Board have had a beneficial effect on railway traffic generally.

In Western Australia the State Transport (Co-ordination) Act, which came into force on July 1, 1934, provides for the licensing of commercial goods and passenger vehicles and aircraft operating south of the twenty-sixth parallel of South Latitude, except goods vehicles operating within 15 miles of the place of business of the owner or the General Post Office, Perth, or vehicles that are used for carrying specified goods, including primary produce. The board is empowered to attach conditions with respect to routes, areas, and records to be kept, and, in respect of omnibuses, fares and timetables and other conditions to prevent uneconomic competition with railways or tramways. The board appointed under the Act may investigate the question of transport generally in the light of service to the community and may recommend the closing or partial suspension of the service of any railway or tramway in cases where the board considers that requirements can best be met by road transport.

THE NEW THORNYCROFT DANDY TYPE.—To the range of Thornycroft models there has recently been introduced what is to be known as the Dandy class. It is a vehicle designed to handle gross loads of from 2½ to 3½ tons and with an unladen weight for registration purposes of 2½ tons so securing the benefits of the £30 annual tax and the 30 m.p.h. speed limit. The power unit is a four cylinder motor that develops up to 50 b.h.p. and the design generally follows that of the successful Handy 2-ton models, of which so many are in railway service. There are two wheelbases, 12 ft. 1½ in. and 14 ft. respectively, available with the normal control model while there is also a forward control type of 9 ft. 6 in. wheelbase.

NEW FORGING MACHINES FOR BOLT AND RIVET WORK

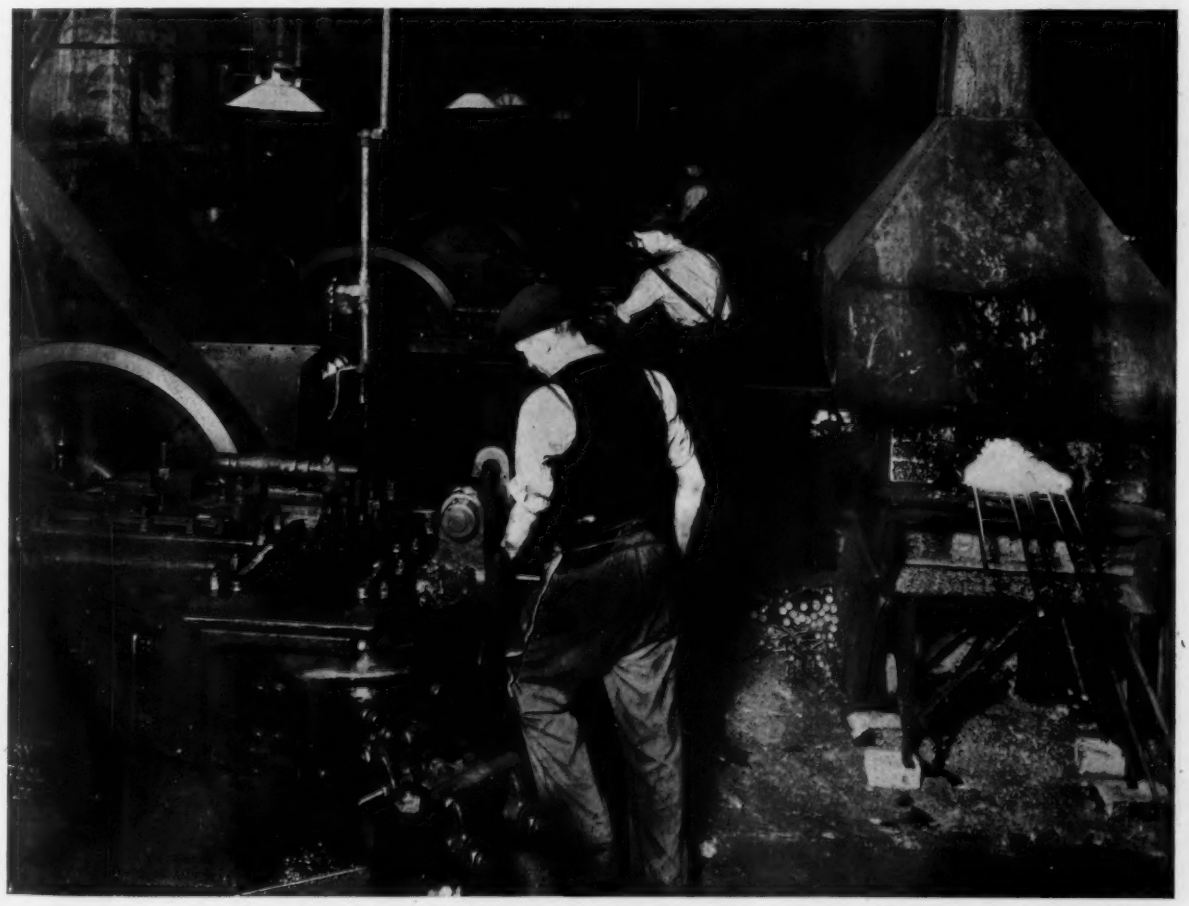
Installed at the Swindon works of the Great Western Railway

DURING a recent visit to the Swindon works of the Great Western Railway when, by the courtesy of Mr. C. B. Collett, we were enabled to make an inspection of new machines recently installed there, our attention was drawn to some new forging machines used for producing bolts and rivets. The installation consists of nine machines manufactured and supplied by the Coventry Machine Tool Works Limited, two of which have just recently been added to the plant in the bolt and rivet making shop. Although the nine machines are chiefly engaged on bolt and rivet making, they can be used for general forging work, the type of machine being supplied in various sizes to deal with $\frac{3}{4}$-in. to $4\frac{1}{2}$-in. material. At Swindon they deal with bar material from $\frac{1}{2}$-in. to 2-in. diameter. They are used for hot working in conjunction with a suitable furnace, and can be operated with facility by semi-skilled workmen.

The principle of working is as follows; The driving pulley, which is driven from the lineshaft, drives a pinion and large gear, the latter running loosely on the crankshaft. When the foot lever is depressed, a patented clutch couples the gear to the crankshaft, thus setting the latter in motion and moving the heading slide forward, at the same time closing the dies on the material. After the heading slide, which carries the upsetting tools, has traversed approximately half its stroke, the dies are completely closed and they then resist the pressure of the tools during the heading operation. The crankshaft and heading slide next complete the cycle by the return stroke, during which the dies are opened and, when all parts have returned to their original positions, the clutch is disengaged and an automatic brake brings them to rest.

The dies and toolholders are arranged for one, two or three operations, as may be required, the last mentioned being chiefly used for general forging work. Small headed rivets are made with one blow but, for hexagon and square headed bolts, two are necessary, one to collect the material in the form of a bunt and a second to finish the head. Shears are generally required for cutting off to length, but are not used in the machine illustrated, which is used for making long bolts from bars previously cut off to length. The position of the shears is on the flat facing shown at the extreme left of the machine.

The following is the method used for standard bolt



Battery of Covmac machines in the bolt and rivet shop at Swindon

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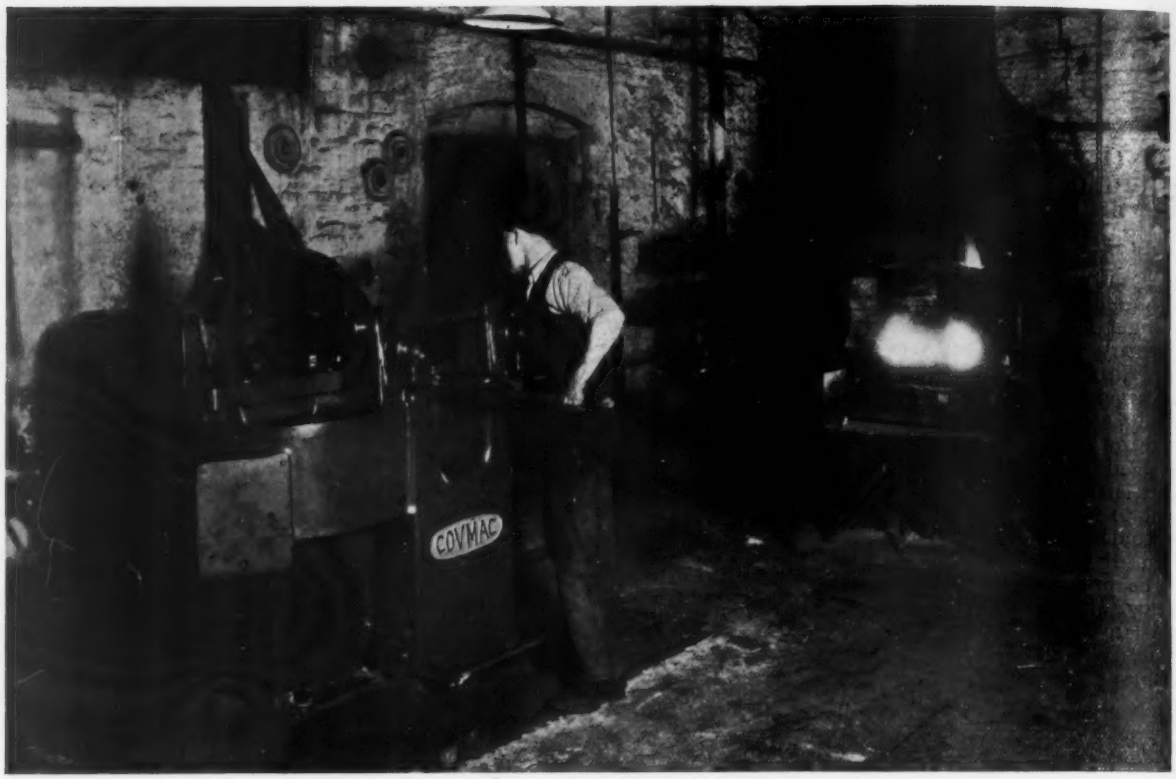
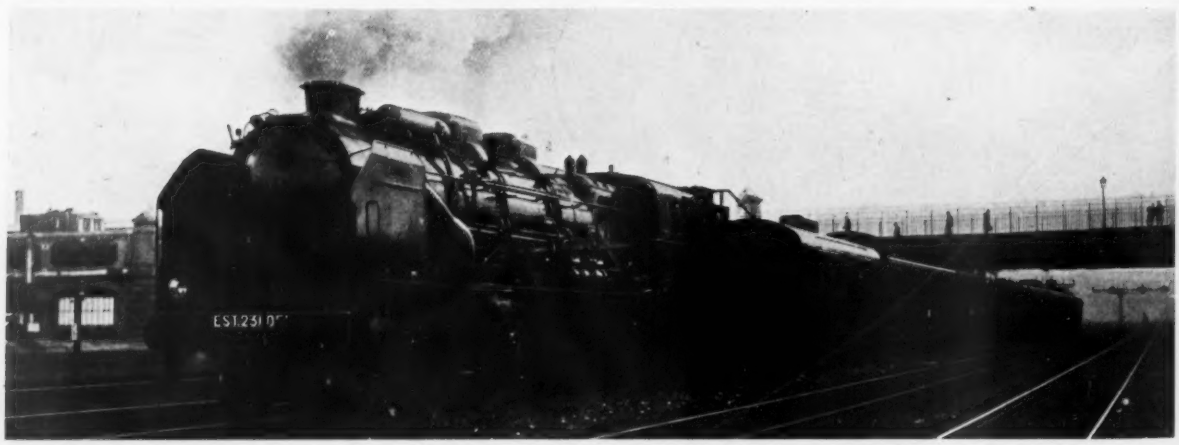


One of the new Covmac machines just installed by the G.W.R. at Swindon works

making: A bar is heated for a length of about 6 in. and the end placed in the fixed right-hand half of the die against a workstop. The operator then depresses the foot lever, which sets the crankshaft in motion, and forms the first operation as previously described. After the machine has been brought to rest, the bar and partly finished forging is removed from the dies, placed in the next impression, and the operation repeated to complete the head. The bolt is then cut off to length by the shears, and the bar returned to the furnace. In the case of short bolts, two and sometimes three articles can be made at one heat. This, however, is not the practice at Swindon works, a sufficiency of bars being kept hot to ensure a continuous supply to the machines.

The photographs show a battery of Covmac machines in the bolt and rivet shop at Swindon and one of the new machines of later pattern recently laid down in an adjoining section of the same building.



The first of 23 P.O.-Midi rebuilt Pacific locomotives for service on the Chemins de l'Est, No. 231051. These locomotives are practically identical with the rebuilt P.O. Pacifics described in "The Railway Gazette" of May 8, 1931, and of which test results were published in our issue of April 8, 1932. They have, however, a standard Est T.I. type of tender giving a "rigid" coupling between engine and tender with the footplate extended over the latter. All 23 locomotives are expected to be delivered by August of this year

RAILWAY NEWS SECTION

PERSONAL

KING'S BIRTHDAY HONOURS

Baron

Sir Arthur Balfour, Bt., K.B.E., Chairman and Managing Director of Arthur Balfour & Co. Ltd., Capital Steel Works, Sheffield; Chairman of High Speed Steel Alloys Limited. For public services.

Privy Councillor

Mr. Leslie Hore-Belisha, M.P., Minister of Transport since 1934.

Baronets

Lieut. - Colonel Cuthbert Morley Headlam, D.S.O., D.L., M.P., Secretary to the Ministry of Transport, 1932-34.

Sir Henry Jackson, M.P., Chairman of Standing Committee on Mineral Transport; Chairman of London and Home Counties Advisory Committee on Transport; an Electing Trustee of the London Passenger Transport Board. For services in connection with transport questions.

Sir (Hugh) Arthur Rose, D.S.O., D.L., Director, London Midland & Scottish Railway Company, David McBrayne Limited, and Scottish Motor Traction Co. Ltd. For public services.

Knights Bachelor

Mr. Clement Preston Colvin, O.B.E., V.D., lately Member of the Railway Board, Government of India, at present Honorary Secretary of the King's Silver Jubilee Fund.

Mr. Bertram Maitland Crosthwaite, V.D., Agent, Burma Railways.

Mr. Arthur Pugh, C.B.E., General Secretary of the Iron and Steel Trades Confederation and the British Iron, Steel and Kindred Trades Association.

G.C.M.G.

Sir Henry Birchenough, K.C.M.G., President of the British South Africa Company; Chairman of the Beit Trustees; Chairman of the Beira Railway Company, the Mashonaland Railway Company, Rhodesia Railways, and Rhodesia Railways Trust. For public services.

K.C.M.G.

Mr. Percy Hubert Ezechiel, C.M.G., Third Crown Agent for the Colonies.

C.M.G.

Mr. Simon James McLean, Assistant Chief Commissioner (Acting Chairman), Board of Railway Commissioners, Dominion of Canada.

C.I.E.

Mr. Joseph Fearfield, Manager of the Bikaner State Railway, Rajputana.

G.B.E.

Mr. Edward Wentworth Beatty, K.C., Chancellor, McGill University, and President of the Boy Scouts' Association, Dominion of Canada. Is Chairman and President of the Canadian Pacific Railway Company, and Chairman of Canadian Pacific Steamships.

Mr. J. A. Milligan, M.B.E.,
District Passenger Manager, London District, L.M.S.R., 1923–35

K.B.E.

Sir Francis L'Estrange Joseph, C.B.E., D.L., Director, London Midland & Scottish Railway Company; Chairman, Birmingham Railway Carriage & Wagon Co. Ltd.; President of the Federation of British Industries. For public services.

C.B.E.

Mr. Thomas Lennox Gilmour, Vice-Chairman National Savings Committee; Director of the Trans-Zambesia Railway Co. Ltd.

Mr. Frederick William Adolph Handman, M.Inst.C.E., Resident engineer in connection with the construction of the Lower Zambesi Bridge, Nyasaland Protectorate.

Alderman Charles Joseph Knight, Traffic Commissioner, South-Eastern Area.

O.B.E.

Mr. Edward Bernard Hart, Principal, Ministry of Transport.

Mr. Henry Hume Saunders, M.B.E., Indian State Railways, Deputy Chief Mechanical Engineer, East Indian Railway.

M.B.E.

Mr. William Condon, Instructor (Locomotive) 1st Class, Railways and Harbours, Kenya and Uganda.

Mr. Charles Clarence Logan, Harbour Master, Port Sudan, Sudan Railways.

Mr. Sorabji Limji Panday, Property Holder and Managing Director, Matheran Light Railway, Bombay.

Mr. Eustace William Porter, M.Inst.C.E., M.I.Mech.E., Engineer and Manager, Caledonian Canal.

Mr. Thomas Smith, Stationmaster, Euston station. For services in connection with overseas visitors.

Mr. Halbert Reginald Wells, Senior Permanent Way Inspector, Railways and Harbours, Kenya and Uganda.

Mr. George Washington Yates, Assistant Deputy Minister, Department of Railways and Canals, Dominion of Canada.

Mr. J. A. Milligan, M.B.E., Passenger Manager, London District, L.M.S.R., is retiring on June 29, upon superannuation after 48 years' service. He has had a wide experience of railway business and, as one of the most popular L.M.S. officers, will carry with him the good wishes of a large circle of railway and business friends for a long and happy retirement. Mr. Milligan entered the service of the former London & North Western Railway at Whitehaven, Cumberland, in 1887, where he had ten years' experience as a booking, parcel and telegraph clerk. He was transferred to the stationmaster's office at Coventry in 1897, and in 1900 moved to the office of the District Superintendent, New Street station, Birmingham, filling positions in the timetable, excursion and other sections. In 1908 he was transferred to headquarters at Euston, and subsequently occupied various posts in the office of the Superintendent of the Line, and assisted many committees appointed to special inquiries through-

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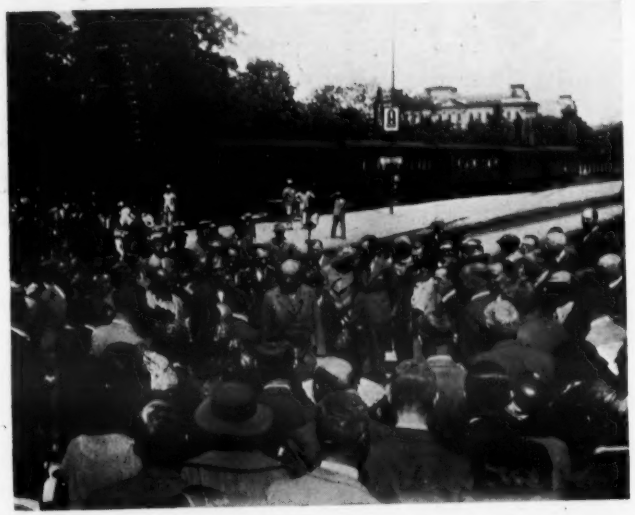
Views on The Institute of Transport Austrian Tour (See page 1131)

Petrol railcar at Gloggnitz

Diesel-electric railcar

Steam locomotive for railcar



Reception at Linz

Photos by] [*A. V. Daniels*

E 3 *electric locomotive on the Institute of Transport special train at Zell am See*

214 *class steam locomotive at Linz*

out the old L.N.W.R. system. In 1922 he was appointed a Commercial Assistant to the Divisional General Superintendent (Southern Division), L.N.W.R., Euston. In 1923 he was made Passenger Commercial Superintendent, London Division, L.M.S.R., which position, with slight modification in district area and title, he has held since that date.

Travel Club Luncheon to Mr. J. A. Milligan

Mr. Percy Clews, European Manager, Canadian National Railways, presided last Tuesday at a largely attended luncheon, representative of British and overseas railways, steamship companies and travel agents, organised by the Travel Luncheon Club, given in honour of Mr. J. A. Milligan, District Passenger Manager, London District, L.M.S.R., on the occasion of his retirement.

On behalf of the assembly Mr. Clews presented Mr. Milligan with an eighteen carat self-winding gold watch, a set of onyx and diamond studs and links, and a lady's travelling case with silver and enamel fittings for Mrs. Milligan.

Mr. Clews, in proposing Mr. Milligan's health, said it gave him great pleasure to be associated with this tribute, and, since it would be impertinent for him to attempt to extol his virtues, it was enough to say that he thought the greatest compliment Mr. Milligan had received was to be able to look round and see the faces of so many with whom he had been associated over such a long period. He concluded by wishing him every happiness and many years of well-earned rest both for himself and Mrs. Milligan.

Mr. C. R. Dashwood, supporting the toast on behalf of the British railways, said that all who had come in contact with Mr. Milligan would treasure recollections of his kindness and official help. He congratulated him most sincerely on the way in which he had managed his life in the railway service, and concluded by expressing his cordial wishes for the future happiness both of himself and Mrs. Milligan.

Mr. D. Mackinnon, representing the British steamship lines, claimed an association of many years with Mr. Milligan, particularly since the opening of the Tilbury landing stage. The appointments of the boat trains at that time were not above criticism, but his reminiscences of travel on the Tilbury line did not impair the cordiality with which he wished Mr. Milligan and all his family long life and happiness.

Mr. T. Potter, speaking for the travel agencies, said that many of those present had known Mr. Milligan long before Mr. Ashton Davies introduced him to a clamorous world. He regretted his retirement from his active business associations because he had conducted them so successfully. Other tributes were paid to Mr. Milligan by Mr. J. Frame (who took the opportunity of wishing success to Major Roberts, who succeeds him), by Mr. L. R. Stanton, and by Lt.-Col. Gilbert S. Szlumper.

Mr. Milligan, in reply, recounted some amusing incidents in his early career, dating from his *début* at the age of 13 when he ran with invoices between the goods and passenger stations at Whitehaven. Later he spent ten years in the booking office, before going to Coventry and then to Birmingham, where he was responsible for the arrangement of the special trains to the opening by King Edward of the Rhayader waterworks. Of more recent date was his memory of Sir Herbert Walker making possible the departure of a train from Euston during a strike by working the signals himself. He thought the greatest problem now before the railways was that of ensuring the smooth functioning of pooling schemes.

The function concluded with a vote of thanks to the chairman proposed by Mr. R. Gardiner.

Railway Clearing House

Mr. E. E. Painter has been appointed by the Directors to be Secretary of the Railway Clearing House in succession to the late Mr. P. H. Price, O.B.E.

South African Railways and Harbours Staff Changes

Mr. R. G. Forbes, Superintendent (Operating), Johannesburg, to be System Manager, Kimberley.

Mr. P. D. Troskie, Superintendent (Operating), Capetown, to be System Manager, Bloemfontein.

Mr. J. S. de V. von Willich, System Manager, Kimberley, to be System Manager, East London.

Mr. E. X. Brain, System Manager, Windhoek, to be Inspecting Engineer, Johannesburg.

Mr. R. S. V. Parsons, System Engineer, Capetown, to be System Manager, Windhoek.

Mr. J. Lindenberg, Locomotive Superintendent, Pretoria, to be Airways Manager.

Mr. G. S. Leverton, Assistant Stores Superintendent, Headquarters, to be Commercial Assistant to the Airways Manager.

Banquet To Celebrate Colonel Crompton's 90th Birthday

The banquet arranged—as previously announced in these pages—to celebrate the 90th birthday of Col. R. E. B. Crompton, C.B., F.R.S., M.I.E.E., &c., was held on May 31, and was attended by nearly 500 distinguished engineers. In the course of the proceedings, Col. Crompton, as well as receiving a photograph of the portrait of himself to which we have previously referred, was the recipient of the certificate of his election as an Honorary Life Member of the Institution of Mechanical Engineers from the hands of Mr. R. E. L. Maunsell, C.B.E., M.A., Vice-President of that institution and Chief Mechanical Engineer of the Southern Railway.

The Chairman, after welcoming the guests, read numerous messages of greeting to Col. Crompton from engineering bodies and individuals all over the world. In proposing Col. Crompton's health, Sir James Swinburne, Bart., outlined his career, and the toast was accorded musical honours. Col. Crompton suitably replied, and other speakers to pay tribute to his remarkable life's work were Professor W. M. Thornton, President of the Institution of Electrical Engineers, and Mr. Maunsell. Mr. George Balfour, M.P., Sir John Snell and Sir J. A. Fleming also spoke.

Among others present were:—

Sir Herbert Austin, Mr. V. Z. de Ferranti, Sir Richard Glazebrook, the Rt. Hon. Lord Hirst, Mr. Frank Hodges, Sir Archibald Page, Mr. Frank Parkinson, Sir Joseph Petavel, the Rt. Hon. Lord Plender, and Sir Felix Pole.

The Engineer and Railway Staff Corps, R.E. (T.A.) Annual Dinner was held on June 3 at the Hotel Metropole, with Colonel-Commanding Sir Herbert Walker in the chair. The principal guests were: Viscount Hailsham, Secretary of State for War; Lt.-Generals Sir Reginald May, Sir Hugh Elles, and the Hon. Sir A. R. Montagu Stuart-Wortley; Brigadier H. N. North; Colonel W. C. Tyrrell; Lt.-Col. A. H. L. Mount; and Sir Herbert Creedy. The other officers present were:

Colonels.—Lord Ashfield, Sir Ralph Wedgwood, Sir James Milne, M. F. Wilson, Sir George Humphreys, Sir Henry Fowler, Sir Robert Elliott-Cooper, and E. F. C. Trench.

Lieutenant-Colonels.—A. J. Barry, E. F. C. Cox, C. J. Brown, R. E. L. Maunsell, H. N. Gresley, H. H. G. Mitchell, Sir David Owen, G. S. Szlumper, G. Ellson, R. Carpmael, T. P. Frank, C. R. Byrom, W. K. Wallace, E. J. Burt, and G. Mills.

Majors.—C. J. Selway, Sir John Eaglesome, F. E. Wentworth-Shields, A. Binns, K. T. Lomas, G. N. Shawcross, H. P. M. Beames, D. C. Urie, R. F. Hindmarsh, R. L. M. Inglis, E. J. Missenden, R. E. Thom, H. Firth, H. B. Smith, F. S. Fisher, E. H. d'E. Darby, W. H. S. Tripp, H. C. B. Whiteley and H. A. Watson, and the Hon. Secretary, R. A. Bacon.

Sir Robert McLean, Kt., B.Sc., was, on May 29, elected Chairman of the Society of British Aircraft Constructors in succession to Mr. Herbert J. Thomas, who has been Chairman for the past two years. Sir Robert, who was one of the most outstanding railway administrators in India, was born in 1884, and was appointed an Assistant Engineer on Indian State Railways by the Secretary of State in 1905. He was promoted Executive Engineer, after varied open line and survey experience, in 1912, and served as an Assistant Secretary to the Railway Board, prior to proceeding to France on military service in the Royal Engineers early in 1918. On returning to India, he was appointed Secretary to the Railway Board in 1919, and, in 1920, was selected to fill the position of Deputy Agent of the Great Indian Peninsula Railway, a preliminary to his appointment as Agent in 1922. During his tenure of office as chief executive of

that railway, the main line electrification and other important works were carried out, and he received his knighthood in 1926. On retirement from Government service he joined Vickers, subsequently to become Chairman of Vickers (Aviation) Limited, on the formation of that company in 1928, and Chairman of the Supermarine Aviation Works Limited on its acquisition by Vickers (Aviation) Limited in 1929.

At a meeting of the Board of Directors of the Associated Equipment Co. Ltd., on June 3, Major General the Rt. Hon. Sir Frederick Hugh Sykes, P.C., G.C.S.I., G.C.I.E., G.B.E., K.C.B., C.M.G., was appointed a Director of the company.

INSTITUTE OF TRANSPORT

The following corporate associate members have been elected, and non-corporate graduates and students have been admitted during May:—

Associate Members

Mr. E. E. Kent, Buenos Ayres Great Southern Railway and Mr. A. G. Norman, L.N.E.R.

Graduates

Messrs. P. C. Barker, L.N.E.R.; H. Bunting, G. Dean and J. G. Read, G.W.R.; H. Burden and W. P. H. Smith, L.P.T.B.; M. C. Conway, B.A.G.S.R.; R. S. Docherty, Central Argentine Railway; F. A. Eallet, Port of London Authority; J. S. Llewellyn and J. A. Neilson, L.M.S.R.; J. W. Shorland, Iraq Railways; and F. V. Storey, Buenos Ayres & Pacific R.

Students

Messrs. L. A. E. Carter, South African R. & H.; C. N. Drabble and G. A. Edwards, B.A.G.S.R.; T. H. England and G. W. Howe, L.M.S.R.; K.C.H. Pearson and J. E. Shaw, G.W.R.; J. F. K. Sandys and C. H. Wooll, L.N.E.R.

INDIAN RAILWAY STAFF CHANGES

Mr. L. Wilson, B.E., has been provisionally confirmed as Agent, and Mr. R. Sephton, B.A., as Chief Engineer, G.I.P.R.

Mr. F. C. Freeman, Superintendent of Stores, A.-B.R., has been granted leave preparatory to retirement as from January 19 last, and Mr. E. B. Francis has been appointed to act in his place as from the same date.

Mr. A. P. G. Rochfort, Deputy Traffic Manager (Transportation), A.-B.R., has been granted leave preparatory to retirement as from January 21 last; Mr. W. P. Field has been appointed to act in his stead.

Mr. R. S. Vipan, Deputy Traffic Manager (Commercial), A.-B.R., has been granted eight months' leave as from January 16, and Mr. V. L. Thompson has been appointed to act in that capacity as from the same date.

Mr. J. H. Bavin, Chief Auditor, A.-B.R., has been granted eight months' leave as from March 18, and Mr. N. H. Lewis acts for him as from the same date.

L.M.S.R. APPOINTMENTS

We are officially informed that the following appointments have been approved by the Directors:—

Chief Commercial and Chief Operating Managers' Departments

Mr. H. E. Roberts, District Goods and Passenger Manager, Derby, to be District Passenger Manager, Euston.

Mr. J. M. Kirkwood, District Goods and Passenger Manager, Leicester, to be District Goods and Passenger Manager, Derby.

Mr. D. S. Inman, Head of Goods Revenue Section, Chief Commercial Manager's Office, Euston, to be District Goods and Passenger Manager, Leicester.

Mr. H. Hauxwell, Railway Goods Superintendent and Steamship Agent, Hull, to be District Goods and Passenger Manager, Northampton.

Mr. W. H. Yemm, Chief Transit and Station Working Clerk, District Goods and Passenger Manager's Office, Leicester, to be Joint Goods Agent, Luton (L.M.S. and L.N.E.R.).

Mr. C. Smith, Goods Agent, Ettingshall Road and Bilston, to be Joint Goods Agent, Ettingshall Road and Bilston, also Deepfields (L.M.S. and L.N.E.R.).

Mr. A. Edwards, Chief Clerk, Lawley Street, Birmingham, to be Goods Agent, Aston.

Chief Operating Manager's Department

Mr. H. Rudgard, Divisional Superintendent of Motive Power, Derby, to be Assistant Divisional Superintendent of Operation, Derby.

Mr. O. E. Kinsman, Assistant Divisional Superintendent of Motive Power, Derby, to be Assistant Divisional Superintendent of Operation (Motive Power), Derby.

Mr. J. W. Watkins, Assistant Divisional Superintendent of Motive Power, Derby, to be Assistant Divisional Superintendent of Operation (Traffic), Derby.

Mr. E. H. Garfield, District Controller, Nottingham, to be District Controller, Saltley.

Mr. C. E. Bachelor, District Controller, Rowsley, to be District Controller, Nottingham.

Mr. F. H. Rhodes, District Controller, Kirkby, to be District Controller, Rowsley.

Mr. H. E. James, Assistant District Controller, Saltley, to be District Controller, Kirkby.

Mr. G. A. Gribble, Cartage Assistant, District Goods Manager's Office, Birmingham, to be Assistant to District Goods Manager (Operating), Birmingham.

Mr. W. W. Hall, Goods Agent, Aston, to be Cartage Assistant, D.G.M.O., Birmingham.

Chief Marine Superintendent's Department

Mr. D. J. Harris, Marine Engineer and Superintendent, Heysham, to be Superintendent Marine Engineer, Euston.

Mr. G. H. Barnish, Assistant Marine Superintendent and Harbour Master, Heysham, to be Marine Superintendent and Harbour Master, Heysham.

Mr. J. K. Gibbon, Superintendent Engineer, Gourock, to be Superintendent Engineer, Heysham.

Mr. J. W. Harrington to be Superintendent Engineer, Gourock.

Chief Civil Engineer's Department

Mr. E. H. d'E. Darby, Divisional Engineer, Derby, to be Assistant Engineer (Permanent Way), St. Pancras.

Mr. S. O. Cotton, Divisional Engineer, Manchester, to be Assistant Engineer (Structures), St. Pancras.

Mr. J. Briggs, District Engineer, Bangor, to be Senior Assistant (Permanent Way), St. Pancras.

Mr. R. L. McIlmoyle, Engineer, Belfast (N.C.C.), to be Senior Assistant (Structures), St. Pancras.

Mr. C. R. Irving, District Engineer, Abergavenny, to be District Engineer, Bangor.

Mr. N. L. Wallis, Assistant to District Engineer, Edge Hill, to be District Engineer, Abergavenny.

Mr. J. Elliott, Assistant to Divisional Engineer, Manchester, to be Assistant to District Engineer, Edge Hill.

We regret to record the death, on June 2, of Mr. Edward Moore, formerly Chief Solicitor of the Great Eastern Railway. Mr. Moore was born in 1848, educated at Epsom College and articled to Messrs. Wilkins, Blyth & Marsland, of St. Swithin's Lane, E.C. He entered the service of the Great Eastern Railway in 1872, as Solicitor in charge of the Common Law Sections and became Chief Solicitor in 1888. He retired in 1915.

With regret we record the death, on May 30, of Mr. D. N. Dunlop, O.B.E., founder and a Director of the British Electrical and Allied Manufacturer's Association, founder of the World Power Conference, and Chairman of its International Executive Council. He was also Chairman of the Fair Trading Council and of the Electrical Fittings Statutory Committee, and took an active part in the foundation of the Electrical Research and of the Electrical Development Associations.

We regret to record the sudden death, on June 1, of Mr. D. McDougall, Cartage Manager, Southern Scottish Area, L.N.E.R.

Mr. John Ellis, late District Superintendent, Western Division, Southern Scottish Area, L.N.E.R., whose death we recorded in our issue of March 29, left estate valued at £7,698.

Mr. W. S. H. Williams, Assistant Divisional Superintendent, Cardiff, G.W.R., is to be Divisional Superintendent, Gloucester, as from July 1, in place of Mr. S. F. A. Morris, who is retiring.

The Institute of Transport Visit to Austria

(*See illustrations on page* 1128)

The Institute of Transport visit to Austria came to an end last Sunday afternoon, June 2, when those who had taken part dispersed at Victoria station after travelling continuously for just over twenty-four hours from Zell am See, the well-known resort on the beautiful Lake Zell.

In our issues of May 24 and 31 we gave an account of the progress of the tour from its beginning on May 18, until May 26, when an excursion by railcar to the Semmering in the company of Herr Ing. Schoepfer, the General Manager of the Austrian Federal Railways, made memorable the second day of the party's stay in Vienna. The following day was essentially a road transport day, the morning being devoted to a tour of inspection of the tramways works at Anschützstrasse, the bus garage at Schanzstrasse, and the staff training school at Hernalser Hauptstrasse, of the Vienna Municipal Tramways. The visitors were accompanied throughout by Herr Werner, the General Manager, and Herr Winter, the Deputy General Manager, as well as by other officials of the undertaking, all of whom readily explained the various arrangements, machines, &c., in operation.

The importance of the tramways system may be gauged from the fact that it carries about 80 per cent. of the total urban traffic of Vienna, which has a population of over 1,875,000. The administration is also responsible for operating the Stadtbahn (the tramway subway providing a quick suburban service, in which as many as nine vehicles are coupled and operated by multiple control) and the city's buses. In 1934 the average numbers of vehicles in daily service were 1,103 tramcars and 1,301 trailers, 66 buses, together with 97 tramcars and 135 trailers on the Stadtbahn. The total number of passengers carried was 468,300,000. At the training school, Herr Werner, the General Manager, welcomed the party. He explained that the economic crisis had hit the undertaking particularly hard and that many projects and works had to be abandoned on economic grounds; however, he expressed the hope that, while the visitors might regard the main workshop as a "patchwork affair" which should long ago have been replaced, they would form the opinion that the management had done its best, in all the circumstances to keep pace with technical progress and avoid a complete stoppage of development. Herr Winter also spoke, dealing with the work of the undertaking in detail.

During the afternoon of May 27, a visit was made by motor coach to the Cobenzl in the Vienna Forest, from which extensive views of Vienna and its environs were obtained. The progress of the construction of the new road to Kahlenberg was noted with interest, as was also the pathway, which had once carried the track of a rack railway. The track disappeared, piece by piece, during the war.

On May 28, the members of the party were the guests of the Danube Steamship Company, which conveyed them in special motor coaches to the Reichsbrucke landing stage. Here they embarked on the company's steamship Franz Schubert (which was gaily decorated) and were welcomed by Herr Korwik, the General Manager, who said that the ties between England and the Danube went back to the Middle Ages, Richard I being still remembered in the tales of Wachau. His own company had been founded in 1829 by two Englishmen, Andrews and Pritchard, and it was English tourists who were the original pathfinders of the Danube. After the President had replied, the ship made a tour of the Danube between the two points at which it is entered by the Danube Canal, thus enabling the visitors to observe the facilities provided for dealing, at Vienna, with river-borne traffic. At a suitable time, refreshments, comprising Austrian dishes and dainties, were served in the saloon, and when the members of the party returned to their hotels for a late lunch their disappointment at not finding a "blue" Danube was more than counterbalanced by their delight at the efficiency and the warm welcome they had experienced from the Danube Steamship Company.

The Danube visit was followed, in the late afternoon, by an official reception by Dr. F. G. Strafella, the Chairman of the Austrian State Tourist Department. It was held at the Kursalon and the host was supported by a distinguished company which included Herr Prinz (under Secretary of State, Ministry of Commerce and Traffic), Baron Eahlen (Permanent Secretary, Ministry of Commerce and Traffic), Dr. Boehler (President, Vienna Chamber of Commerce), Herr Schoepfer (General Manager, A.F.R.), Herr Nouackh (Chief Operating Manager, A.F.R.), Herr Kaan (Chief Electrical Engineer, A.F.R.), Herr Nussbaum (Deputy Chief Mechanical Engineer, A.F.R.), Herr Kankovsky (Secretary, A.F.R.), Herr Jary (Divisional Manager, Vienna, A.F.R.), Herr Paul Katscher (A.F.R.), Herr Werner and Herr Winter (General Manager and Deputy General Manager, respectively, of the Vienna Municipal Tramways), Herr Korwik (General Manager, Danube Steamship Company), and Dr. Steyrer (General Manager, Austrian State Tourist Department). Tea was served and at its conclusion, Dr. Strafella briefly expressed his pleasure at the decision of the Institute to visit Austria, and the hope that, during the visit, Austria, small though the country was, had shown itself worthy of British sympathy. In reply, Mr. Garcke referred to the excellence of the Austrian tourist organisation and said that his fellow visitors were not likely to forget the warmth of the welcome which had been given them.

There was no official programme for May 29 or for the morning of the following day upon which at 12.20 p.m. was due the departure from Vienna for Badgastein. At the West station was the station band to enliven the entrainment and principal officers of the A.F.R. and the Vienna Tramways were present to wish farewell to the party. Promptly at 12.20 the train steamed slowly out of the station to the strains of the National Anthem.

The journey to Badgastein was made *via* Salzburg, and Schwarzach-St. Veit where the train branched off on to the Tauern line. This line climbs to a height of over 4,000 ft., penetrates great mountains and traverses deep gorges and valleys, and must be reckoned one of the foremost achievements of Austrian railway engineering. It proceeds beyond Badgastein to Spittal-Millstättersee and the electrification of the line was completed as recently as April last.

On May 31, the Austrian Federal Railways kindly afforded the party the opportunity of travelling over the remaining part of the line from Badgastein to Spittal and so of observing the engineering wonders involved in its construction (including the Tauern tunnel—5 miles, 551 yd. long), as well as of enjoying the beautiful views from the train of the green valley below and its little townships and the mountain beyond it. *En route*, a stop was made at Mallnitz to inspect the substation there and there was a short stay at Spittal before making the return journey to Badgastein.

It should be mentioned that musical and civic honours had not ceased on leaving the great cities. Both at Badgastein and at Spittal where the party only remained about half an hour, bands and local government officials were on the stations to assure all of a hearty welcome.

Badgastein, Austria's leading Spa dominated by a majestic waterfall, was notable in the tour for several reasons. The weather was indifferent throughout the stay there; it gave an opportunity of rest after busy days in the great towns; the whole party was accommodated at one hotel; thanks were expressed to those who helped to make the tour a success; telegrams were sent to the Austrian Chancellor expressing thanks for the generous hospitality and warm welcome everywhere received in Austria, and to the General Manager of the Federal Railways tendering thanks for the splendid facilities his administration had so readily placed at the disposal of the party throughout the tour.

Thanks to those concerned in the conduct of the tour were expressed in

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the course of a reception given by the President before dinner on May 31. First, Mr. T. E. Thomas (General Manager, Tramways, L.P.T.B.) moved, and Mr. G. S. Bocquet (Traffic Manager, Eastern Bengal Railway), seconded a resolution of thanks to the President himself for able leadership and for the eloquent and apt manner in which he had on all occasions spoken on behalf of the party.

In his reply, Mr. Garcke modestly endeavoured to transfer the company's appreciation to others, and made graceful references to the work of the Secretary of the Institute and his Assistant, and to that of Herr F. Strauss of Vienna and of Mr. K. W. Leaver of the London Office of the Austrian State Tourist Department. The two last-named were not directly connected with the Institute but had accompanied the tour and done everything in their power to ensure its success. In recognition of their work, presentations were made to them—a gold fountain pen to Mr. Strauss, and a silver cigarette case to Mr. Leaver.

After dinner there was a display of local dancing by natives of Badgastein which had been arranged by the Spa Manager and this was followed by dancing for all the company.

On June 1 Badgastein was left behind and the last call of the tour was made at Zell Am See. Under three hours were available for the stop and the principal business was lunch, but a band was on the station to greet the party, which was also welcomed by local officials. The Zell Am See tourist organisation under the leadership of Herr Muehldorf had prepared for the visit by providing an electric launch (the *Grossglockner*) to take members of the party round the lake and when, during lunch, rain set in, quickly produced motor coaches to convey them back to the station. At 2.40 p.m. the party left Zell Am See for London. Buchs was reached after re-traversing the glorious Arlberg route, and there goodbye was said to the special train which had been theirs for a fortnight, and to the kindly and helpful atendants who had accompanied it throughout. One coach, however, was left, namely, a through coach to Calais for the benefit of those who had no need to transfer to sleepers at Buchs; two members of the party who spurned it and sought exclusiveness in another part of the train, awoke to find themselves cut off from their comrades. However, there was a happy reunion with them at Calais and, after a pleasant crossing on the *Cote d'Azur*, Victoria station was reached and there friends parted, carrying with them happy memories of an enjoyable and instructive tour.

AUSTRIAN TRAVEL OFFICE.—The address of the Austrian State Travel Bureau is now 159-161, Regent Street, W.1. The telephone numbers are Regent 5581-5583. This bureau has absorbed the Austrian Federal Railways Official Agency, formerly at Eros House, 31, Regent Street.

MINISTRY OF TRANSPORT ACCIDENT REPORT

Liverpool Street, L.N.E.R.: November 24, 1934

This station lies roughly north and south, the platforms being numbered from west to east. Outside the station are three pairs of up and down running lines. The most westerly of these pairs are the down suburban and the up suburban, which are connected with roads Nos. 1, 2, 3, and 4. A train arriving off the up suburban in No. 1 road crosses the path of a train departing from No. 4 on to the down suburban. To safeguard this and the corresponding reverse fouling movement, a depression bar, 50 ft. in length, is provided which, should a train in No. 1 road not have run far enough along the platform, would remain depressed and would electrically lock the starting signal for leaving No. 4 road.

At 8.48 in the morning the tail of the arriving train came to rest on the bar but, despite that, the starting signal for No. 4 road was put to "clear" and, on a train for Wood Street leaving, it struck the left rear corner of the last vehicle of the train that had just arrived from Enfield Town in No. 1 road.

Colonel Woodhouse, in reporting on the accident, says that this method of protection against fouling movements, by locking the relevant signals, has been adopted in preference to protection by means of interlocking between the points concerned on account of the density of the traffic; it enables points to be set individually in readiness for the departure of a train as soon as an incoming train clears them, and the departure signal to be lowered as soon as the fouling point is clear.

An indicator is provided on the instrument shelf to show whether the levers that are controlled by the depression bar are free or locked, but it is some 12 ft. away from the group of levers here concerned. As a result, the signalmen had got in the habit of trying the lever they wanted in order to see if it were free, instead of going to look at the instrument. There was consequently considerable wear on the lock, and on the occasion in question the grasping of the starting signal lever, No. 140, forced the lock out of the notch in the tappet.

The last overhaul of the electric locking was made on August 25 by assistant linesman Jeffers, who came to the conclusion that the tappet and lock on No. 140 lever needed no attention. He admitted that he made this inspection with the tappet in its working position, without removing the roller on which it runs or dropping the tappet into a convenient position for examination. He agreed that it was difficult to see the working face of the tappet notch unless it was so lowered.

Colonel Woodhouse concludes his report by observing that it was obvious that the wear referred to would not have occurred, unless the tappet had frequently been drawn into forcible contact with the lock, or, in other words, unless the signalmen were in the habit of "feeling" the locking before reversing the lever, but he does not think that they can be blamed for this. The density of the Liverpool Street suburban service is well known,* train departures from the group of four platforms served by the up and down suburban lines taking place continuously, during rush hours, at intervals of 2, 2, 4, and 2 minutes; the 4 minute interval is necessary to allow the crossing movement from No. 4 platform to the down suburban line, which fouls the path of up trains, to take place. It is consequently not surprising that the signalmen have become accustomed to rely on the "feel" of the locking not only to ascertain when the road has been set for them by other men in the box, but also to tell when fouling movements are clear, particularly as visual observation is often difficult, as on this occasion.

The lock concerned was installed some 30 years ago, and is of a pattern then largely used; there are 47 such locks on the levers in Liverpool Street West box alone, and many have been used elsewhere. The company's officers stated that they have given good service, a failure similar to that now under consideration being unknown hitherto. But the design, with its relatively large clearance between the tappet and the guides through which it passes, is such that the maintenance of a square face on both lock and tappet is of great importance, since so small an amount of wear of the latter as that already described was sufficient to allow the lock to be forced out of engagement. Moreover, wear of the roller or excessive clearance between it and the pin carrying it, by allowing the tappet to drop slightly, will prevent the lock engaging it for the full depth of the notch, and this had apparently occurred.

In this connection Colonel Woodhouse is glad to be able to record that the company has arranged for this electric locking to be examined and adjusted at intervals of 2 months, instead of 3, in future; it is desirable to impress upon the linemen concerned the need for accuracy when trimming up the tappet notches and locks, and the importance of ensuring that they make contact over the full width and depth of the former. He finally suggests that the company should also be asked to move the indicator actuated by the depression bar nearer to the levers affected, in order to lessen the need for "feeling" the locking, and the wear consequent thereon.

* A description of the density of traffic into and out of Liverpool Street was given in THE RAILWAY GAZETTE of October 1, 1920.—Ed. *R.G.*

£35,000,000 Scheme of London Suburban Railway Electrification and Tube Extension

Details of important statement by the Chancellor of the Exchequer on Government guarantee of loans

An important statement of Government policy regarding suburban electrification and tube extension in the London area was made in the House of Commons on Wednesday (June 5) by Mr. Neville Chamberlain, Chancellor of the Exchequer, in reply to a question. To ensure speed in inaugurating the work the Government has agreed to give an Exchequer guarantee of the loans to be raised, so that the London Passenger Transport Board and the railway companies concerned may undertake at once the whole programme.

The question out of which this statement arose was that asked of the Chancellor of the Exchequer by Sir George Hamilton as to whether he was now in a position to make any statement of the attitude of the Government towards the provision of financial facilities to enable urgently required railway and other transport improvements in the London area to be carried out. Mr. Chamberlain replied:—

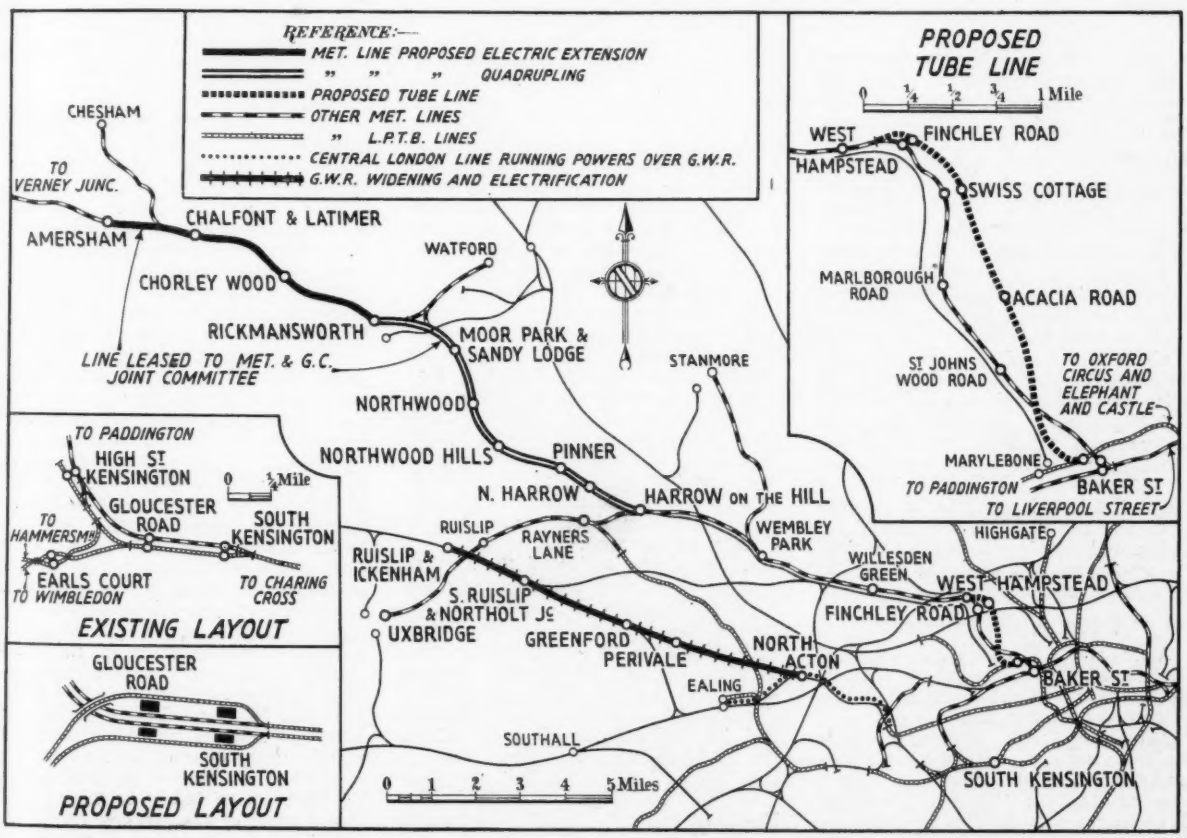
I am glad to say that, as the result of negotiations which have lasted over many months, arrangements have just been concluded between the Government and the Standing Joint Committee of the London Passenger Transport Board and of the main line railways under which, subject to the necessary Parliamentary sanctions, the London Passenger Transport Board, the London & North Eastern Railway, and the Great Western Railway, will enter at once upon a programme of great improvements and extensions of London transport.

In addition to the extensive scheme of work included in the private Bill of the Transport Board now before Parliament, the programme covers the electrification of the suburban lines of the London & North Eastern Railway in North East London into Liverpool Street, and also of some lines in North London, as well as the construction or extension of tube railways to give new connections between these electrified lines and the City and the West End.

I will circulate a more complete description of the programme in the official report, and so far as hon. members may wish for still further information, they will no doubt address their inquiries to the Minister of Transport, who has been closely associated with me in the negotiations and who regrets, as I do, that the arrangements were not completed in time to enable a statement to be made on Monday, June 3, in the discussion of the Vote for the Ministry of Transport.

Owing to the high level at which Government credit now stands—and I am, of course, assuming the continuance of that high level until the necessary capital is raised—an Exchequer guarantee of the loans to be raised will suffice to enable the Board and the railway companies to undertake at once the whole programme, much of which would otherwise have had to be deferred.

The legislation required to authorise the guarantee will be introduced as quickly as possible after the recess. That will be a Government Bill. Hon. members will understand that with a



Sketch map showing new widening and electrification works proposed on the G.W.R. line between North Acton and Ruislip, and also the new works for which the London Passenger Transport Board is seeking powers in the present session, and which are incorporated in the new scheme

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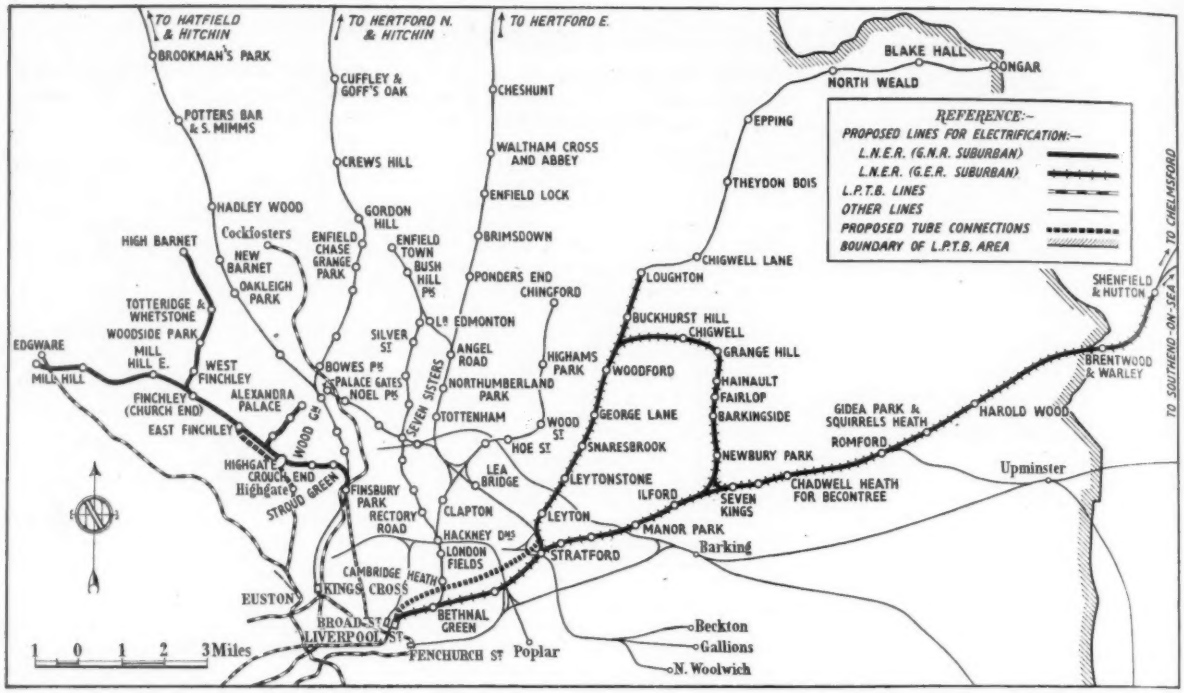

Sketch map, showing sections of L.N.E.R. suburban lines to be electrified, and also proposed tube connections therewith at Highgate, Finsbury Park, and Stratford

programme of this magnitude, involving three undertakings, Parliamentary powers in the form of several private Bills will be necessary. In particular I hope that the London Passenger Transport Board will be able to introduce very shortly a private Bill necessary to enable it to make immediate progress. In these circumstances I trust that Parliament will be willing to accelerate the passage of the necessary legislation to the maximum extent it may deem appropriate.

The programme involves the building of about 12 miles of new tube railways, the electrification of approximately 44 miles of suburban railway, the doubling and electrification of about 12½ miles of further suburban railways, and the substitution of trolleybuses for tramcars on 148 route miles. The total cost of the works included in the programme is in the region of £35 millions. I understand that it is hoped to complete the works within a period of five years from the date of the loan.

Outline of the Proposals

After the Chancellor of the Exchequer had given the above answer, the following official document giving further details was issued:—

The programme comprises three major schemes of development of the underground and suburban railway systems in the London Passenger Transport area. It also provides for the substitution of trolleybuses for trams in various parts of London, the reconstruction of tube stations at King's Cross, Post Office, and certain other stations in the central area, the enlargement and improvement of the power supply of the London Passenger Transport Board, and other ancillary works.

The document then gave particulars as follow:—

1. *The electrification of the London & North Eastern Railway suburban lines in North-East London, and the construction of a tube railway to connect with them to give a direct service to the central area.*—Under this scheme it is proposed to electrify the line from Liverpool Street to Shenfield, also the Loughton and Grange Hill branches. The tube railway will be constructed in continuation of the Central London Line from Liverpool Street eastwards to a point where it will connect with the Loughton and Grange Hill lines, so as to permit of the running of through trains to stations in the West End of London and beyond.

2. *The electrification of the London and North Eastern Railway suburban lines in North London, and the extension of the tube railways to connect with them so as to give a direct service to the City and the central area.*—Under this scheme it is proposed to electrify the Edgware, High Barnet, and Alexandra Palace lines; to extend the Highgate tube to make a connection with these electrified suburban lines at Finchley; to extend the Northern City tube, which now terminates at Finsbury Park, to make a connection with the electrified suburban lines near Finsbury Park. Through services of trains will be operated from all branches to the City, and from the Edgware and High Barnet lines to the central area. A convenient interchange station will be provided at Highgate for passengers transferring from the Alexandra Palace branch to the services running to the central area.

3. *The construction and electrification of two additional tracks to the Great Western Railway from North Acton to Ruislip.*—The Central London tube trains now terminating at Wood Lane will be extended to operate over this line so as to provide direct services to the central area and the City in place of Paddington.

4. *The construction of a tube railway from Finchley Road to connect with the Bakerloo tube, and the reconstruction of the electrified lines of the Metropolitan extension line.*—Through services of electric trains will be operated from stations on the Metropolitan extension lines to the central area, as well as to the City, and a more regular and frequent service of trains will generally be provided.

5. *The reconstruction of the junctions and stations at Aldgate East.*—This improvement will enable trains from the Metropolitan Line to be projected to Barking and Upminster and a full service afforded to these points.

6. *The substitution of trolleybuses for tramcars on* 148 *route miles in different parts of the London area.*

7. *The reconstruction of stations at King's Cross, Post Office, and at other points in the central area.*—These improvements, which include the sub-

stitution of escalators for lifts, will provide accommodation for the additional volume of traffic to arise from the new extension services which will come into the central area.

From these somewhat meagre details, which probably will not be amplified for some time, it appears that the main idea of the scheme is the projection of the London Passenger Transport Board's services beyond present dead ends over certain suburban lines of the main line railways. The scheme involves only a small proportion of the G.E.R. and G.N.R. sections of the L.N.E.R. which have been examined in the past with a view to electrification.

A notable feature is that the King's Cross to Finsbury Park line of the L.N.E.R. is not scheduled for electrification, but that the Northern City Line of the L.P.T.B. is to take over the G.N.R. electric services at Finsbury Park and convey them to Moorgate. As the Great Northern & City Railway, this line was originally intended to have such a physical connection and was actually built to a loading gauge to accommodate main line rolling stock.

In the past it has been found impracticable to put in hand works for improving rail transport in north and east London by reason of the uncertainty of what new road transport competition might arise. The present plans have been made possible by the establishment of the London Passenger Transport Board with stabilising and monopoly powers, and also the Standing Joint Committee with the main line railways for pooling passenger receipts. Such works as those now envisaged are, of course, facilitated by a pool which eliminates as far as possible divided interests between the various transport agencies concerned.

It will be noticed that the plans include those railway works for which the L.P.T.B. is seeking powers in the present session, and also, apparently, the full scheme of conversion from tramway to trolleybus working in practically the whole suburban area around London, for 90 miles of which London Transport secured powers last year and seeks authority this year for the balance of about 58 miles.

NUREMBERG RAILWAY EXHIBITION.—During this, the centenary year of the German railways, Nuremberg is organising an exhibition to be held from mid-July to the beginning of September. In a large hall, many types of locomotives, coaches, and trucks will be on view, and numerous pictures will illustrate the construction of lines, the collaboration of railways with other modes of transport, the social welfare of railway workers, and the part played by railways in the economic field. One of the chief exhibits will be an exact reproduction, running on a specially installed line, of the first German train, which left Nuremberg in 1835. Visitors will also be able to see the Nuremberg transport museum, which is being enlarged.

Institute of Welding

Address by Sir Alexander Gibb, C.B., G.B.E., M.Inst.C.E., M.I.Mech.E., F.R.S.E., President of the Institute of Welding, to the twelfth annual general meeting of the institute, held on June 3

In the course of his presidential address, Sir Alexander Gibb stressed the need for a strong central organisation for the guidance of all interested in the technical problems connected with welding. Welding demanded special study and specialised treatment, and although British engineering might in some ways be behind Continental, it was, he said, little, if at all, behind in its technique. British engineers were essentially cautious, but nevertheless we had many major achievements and innovations to our credit.

He then went on to outline the scope of welding in the sphere of structures, shipbuilding, railway rolling stock, the electrical industry, bridges, boilers, and machines. On the subject of rolling stock, he pointed out that 150 60-ft. underframes for passenger stock for the L.N.E.R. had been built, and that welded underframes were also to be used for the Silver Jubilee streamlined train on the proposed very fast schedule between London and Newcastle. The saving in weight behind the tender thus secured by the elimination of riveting would be considerable.

Turning to bridges, he instanced the Newport approach bridge over the railway branch line as the best example in this country, though on the Continent, and especially in Germany, there were hundreds of welded steel spans up to 300 ft. in length. The first all-welded boiler was brought into use in London a short time ago. Switzerland had used them for high pressures for the past ten years. Bedplates for machines were, he remarked, rapidly becoming standard practice, as also for diesel engine frames.

Referring to the Symposium on the Welding of Iron and Steel presented last month under the auspices of the Iron and Steel Institute, he stated that seven or eight hundred engineers had attended each session in the attempt to satisfy the demand for information on welding, and for the scientific and specialised investigation of welding problems. It had been found advisable to amalgamate the two British organisations which deal with welding, namely, the Institution of Welding Engineers and the British Advisory Welding Council, so as to keep pace with the rapid progress of the application of welding. The result had been the formation of the Institute of Welding, which would cover the functions of both organisations and undertake a very comprehensive programme of work. It represented the consolidation of all welding interests.

Companies and firms were vitally concerned in the satisfactory progress of welding research, and as they were usually more easily able to bear the cost of extensive research work, their support was felt to be essential, though at the same time the institute was not, he pointed out, directed to propaganda in any form. Information as to membership, fees, &c., had, he said, been circulated in the new articles of association, but scientific societies and institutions were invited to join the institute as patrons without entrance fee or subscription. There were at present about 800 individual members of the institute. Sir James Lithgow, Sir William Lark, and Mr. Ralph Freeman had accepted the positions of Vice-Presidents, and Mr. R. Biggart, Mr. Lawrence Ennis and Mr. McCance had agreed to serve as Councillors, representing the Industrial Corporate Membership class. Certain other places on the council had been left vacant, to be suitably filled as opportunity offered.

Sir Alexander voiced the grateful thanks of the institute to the retiring President, Mr. C. W. Hill, who would, however, be available to join in the administration, and several founders of the Institution of Welding Engineers and other members of the old organisation would be on the council. He also expressed his firm conviction that the Institute of Welding would play an increasingly important part and a much needed rôle in British engineering progress.

New Oiler for Railway Points

Joseph Kaye & Sons Ltd., of Lock Works, Leeds, and 93, High Holborn, London, W.C.1, has sent us particulars of a seamless steel valve oil-feeder specially designed and manufactured for lubricating railway points.

This is of exceptionally strong construction, the body being solid drawn from sheet steel suitably tinned. Strong serrated joints and a double wrapped spout are employed, the result being a practically seamless form of construction. The oil cans, which are made in two sizes, having a capacity of 2 pints and 4 pints respectively, are fitted with a handle extending from the front to the rear, with a plunger-operated spring valve at the forward end, projecting above the handle. By this novel means a firm grip can be secured, while the valve is easily operated by the thumb in a natural and convenient manner. This patent oilfeeder has already been adopted by one of the large railway groups, from whom repeat orders have been received.

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QUESTIONS IN PARLIAMENT

Mersey Tunnel and Mail Traffic

Mr. Cleary asked the Postmaster-General on May 13 whether he would consider making a contribution to the finances of the Mersey tunnel undertaking in view of the fact that his department, which previously paid £2,000 per annum for conveyance of mails via the Mersey Railway and £200 per annum to the Birkenhead Corporation ferry steamers, now conveyed mails free of all charge through the Mersey tunnel, the total value of which free service from July 18, 1934, to April 30, 1935, was £2,434 6s. 9d., and also bearing in mind that any contribution would be welcome relief to the ratepayers of Liverpool and Birkenhead, who had to pay over £2,000,000 increase on the original estimate of £5,000,000 for the cost of the Mersey tunnel.

Sir Kingsley Wood: I regret that I do not see my way to grant a contribution from Post Office funds for the purpose mentioned.

Argentine Railways

Sir Cyril Cobb, on May 20, asked the Secretary of State for Foreign Affairs whether he would represent to the Argentine Government, when the trade agreement came up for renewal a short time hence, that no return had been received during the past five years on £105,000,000 of capital invested in Argentine railways, and that the recommendations of the Ortiz-Nogues investigation committee were not improving the earning powers or restoring the credit of the railways to enable capital to be raised for repairs and extensions of the Argentine railway system provided by British savings for the development of Argentina.

Sir John Simon: I can assure my hon. friend that the position of the British railways in Argentina receives the constant consideration of His Majesty's Government.

Mr. Burnett, on May 28, asked the Secretary of State for Foreign Affairs whether he would ascertain why the earlier award by the Argentine President, prior to the Ortiz-Nogues recommendations, for improving the working of the Argentine railways had not been carried out; and would he notify the Argentine Government that the operation of clause 8 of the presidential award, as well as the Ortiz-Nogues recommendations, would be considered in relation to the extension of the Argentine trade agreement so as to protect British capital sunk in Argentine railways.

Mr. Eden (Lord Privy Seal) replied: I am informed that an interpretation by the President of the Argentine Republic of the clauses of his previous award, over which there has been difficulty, is expected to be issued shortly. As regards the recommendations referred to by my hon. friend, I understand that they will have to be submitted to the Argentine Congress before they can take effect.

Finances of the Tientsin-Pukow Railway

Mr. Moreing, on May 22, asked the Secretary of State for Foreign Affairs whether he was aware that the net earnings of the Tientsin-Pukow railway during each of the years 1932, 1933, and 1934 had been more than sufficient to pay twice the annual interest on the various portions of the railway's foreign bond issue; and what reasons were alleged by the Chinese Government for the continuing default in the payment of interest to British bondholders.

Mr. Moreing also asked the Secretary of State for Foreign Affairs whether he was aware that interest on the British portion of the Tientsin-Pukow railway loan was 10 years in default; that the net earnings of the railway in 1932, 1933, and 1934 had in each of these years been more than sufficient to pay four years' interest on the British portion of the loan; and what had been the result of the representations made by His Majesty's Minister to the Chinese Government.

Mr. Moreing further asked the Secretary for State for Foreign Affairs whether he was aware that debts contracted by the Tientsin-Pukow railway many years after the issue of the railway's foreign bonds had been paid off, in spite of the fact that the service of the foreign bond issue was seriously in default; and whether he would direct His Majesty's Minister in China to request the Chinese Government to place some definite interest-bearing security under the control of the Chinese customs department for the service of the foreign bond issue of this railway.

Sir John Simon, replying to the three questions together: No figures of net revenues have been made public, but there seems no reason to doubt that the railway is earning substantial profits. I do not know what are the debts referred to; but if my hon. friend will supply me with particulars I will institute enquiries. The bondholders are entitled to be paid out of the general revenues of the Chinese Government as well as to a first charge upon the increase in Customs revenues consequent upon the abolition of certain likin taxes. His Majesty's Minister has constantly pressed these claims upon the attention of the Chinese Government, and the reason advanced for not meeting them is that a comprehensive scheme of dealing with railway indebtedness is in preparation. Every suitable opportunity will be taken of reminding the Chinese Government of their obligations in this connection.

Air Services and M.P's Vouchers

Sir Robert Hamilton, on May 22, asked the Secretary to the Treasury whether he was aware that, since the arrangements were originally made whereby a member might obtain railway and steamer tickets to his constituency on presentation of a voucher, certain airline services had been and were about to be established; and whether he would consider making the voucher system applicable to travel by air where airlines were available.

Mr. Duff Cooper.—I am aware of the recent developments in air services to which the hon. member refers, and I have recently arranged for the departments concerned to consider whether it is practicable to extend the present voucher system without undue inconvenience or additional expense to the Exchequer, so as to enable hon. members to utilise such services where available for travelling to and from their constituencies.

Political Advertisements Displayed on Railways

Mr. West, on May 29, asked the Minister of Transport whether the policy of the London Transport Board respecting the display of political advertisements on its railways had been recently changed, and, if so, why.

Mr. Hore-Belisha.—I am informed that the answer is in the negative.

Rail and Air Booking Facilities

Mr. Dickie, on May 29, asked the Minister of Transport whether, in view of the necessity that railway companies should move with the times and also in order to assist the future of civil aviation, he would reconsider the decision of his predecessor and intervene with the railway companies, with a view to ensuring that equal booking facilities were made available to the public for air travel by all British air lines at all recognised agencies.

Mr. Hore-Belisha.—This would appear to be a domestic matter concerning the railway companies and their agents.

Bulgill to Cockermouth Railway

Captain Dower, on May 29, asked the Postmaster-General, if he was aware that since the closing of the Bulgill to Cockermouth railway the morning mail in Cockermouth was delivered about 10 o'clock, causing considerable inconvenience to business people and tradesmen; and would he state what steps he proposed to take to arrange for an earlier delivery.

Sir E. Bennett (Assistant Postmaster-General) replied: The L.M.S.R. found it necessary to suspend this passenger train service because the line was unsafe. The question of providing a more satisfactory alternative service is under discussion with the company.

Palestine Railways

Captain Peter Macdonald, on May 30, asked the Secretary of State for the Colonies when the report of Sir Felix Pole on Palestine railway development would be available; and what steps would be taken to ensure that all new construction work involving the import of material would be available in the first place to British manufacturers.

Sir P. Cunliffe-Lister.—I do not think the High Commissioner has yet actually received Sir Felix Pole's report, and no decision has been taken on the

question of publication. Any materials which it may be found necessary to import in connection with railway development in Palestine will be ordered through the Crown Agents for the Colonies in accordance with the usual practice

Railway Lorry Drivers' Wages

Capt. Strickland, on June 5, asked the Minister of Labour whether there was any difference in the agreed rates of wages paid to motor lorry drivers by transport organisations and by railway companies, respectively.

Mr. R. S. Hudson (Parliamentary Secretary, Ministry of Labour), replied. —The wages and conditions of employment of the two categories of lorry drivers mentioned are not established on a uniform basis, but are separately negotiated. In the case of the railway motor lorry drivers, the wages and conditions of employment are settled by agreements between the railway companies and the National Union of Railwaymen. In the case of motor lorry drivers employed by transport concerns other than railway companies, wages and conditions of employment are negotiated by the National Joint Conciliation Board for the Road Motor Transport Industry (Goods) in respect of England and Wales, and by the Scottish Conciliation Board for the Road Transport Industry (Goods) in respect of Scotland.

PARLIAMENTARY NOTES

Indian Railway Administration

On the report stage of the Government of India Bill in the House of Commons on May 28 clauses 180 to 186 relating to railways were dealt with. A large number of Government amendments were agreed to, mostly of a drafting and minor character. A few, however, were of some importance.

Sir Donald Somervell (Solicitor General) moved an addition to clause 186 (provisions as to certain obligations of the Federal Railway Authority), the effect of which would be to put an obligation on the Railway Authority to repay to the Federation any damages, costs or expenses in connection with proceedings brought in respect of railways in India. The amendment was agreed to, as were other amendments to make clear some points of financial detail.

Sir Thomas Inskip (Attorney General) moved an amendment to clause 192 (appeal by State to Railway Tribunal from certain directions of Federal Railway Authority). He said that the clause dealt with a direction by the authority in connection with unfair discrimination. The amendment was designed to meet the criticism emanating from the States that the States might suffer serious losses owing to their railways being required to provide special facilities in times of emergency to the detriment of their traffic. In the State of Hyderabad there were very efficient and well managed railways, and the amendment enabled a State in such a case to appeal to the Tribunal and obtain compensation or damages if they were in a position to establish their complaint. Replying to a brief discussion, the Attorney-General said that if there were an all-India emergency which required the railway of the State to be used for the purposes of the defence of the whole country, he had no doubt that they would not be treated as discrimination for which compensation was intended to be provided.

The amendment was agreed to.

On clause 195 (railway tribunal), Mr. Raikes moved to leave out the latter part of sub-section 4. The subsection states that an appeal shall lie to the Federal Court from any decision of the Railway Tribunal on a question of law, but no appeal shall lie from the decision of the Federal Court on any such appeal. The words proposed by Mr. Raikes to be omitted were from the word "law" onward. He said it was unsatisfactory that the Privy Council should be debarred from hearing appeals from decisions of the Railway Tribunal. The Privy Council had been regarded by India as the supreme fount of justice.

The Attorney General said that the Railway Tribunal would have to consider questions of purely local interest. It would be likely to lead to great difficulty in administration if questions relating to railway working facilities and matters of that kind were to be held up until a decision could be obtained from the Privy Council. It was a fairly familiar feature, in giving constitutions in different parts of the Empire, to establish special tribunals for the purpose of dealing with certain matters having some special characteristics. It was a familiar provision that the decision of such a tribunal should not be subject to appeal to the Privy Council.

The amendment was negatived.

On clause 196 (rights of railway companies in respect of arbitration under contracts), the Solicitor-General moved an amendment and said that the clause was meant to deal with the case where there was an existing contract between the railway company in India and the Secretary of the State in Council, with an arbitration clause. It was necessary to adjust the position to the position as it would be under the Bill. Under the amendment the dispute was deemed to have arisen between the company and the Secretary of State instead of the company and the Secretary of State in Council. Then the arbitration took place between the company and the Secretary of State, and the award was binding on the Federation.

The amendment was agreed to.

Transport Minister and the Railways

Mr. Hore-Belisha, Minister of Transport, speaking in Committee of Supply of the House of Commons on June 3 on a vote of £39,098 for the Ministry of Transport, referred among other things to the railways. In that connection, he said that while much had been recently done to regularise the carriage of goods and passengers by road, these services were still free from certain obligations under which the railway companies laboured, such as having to carry all passengers and virtually all goods offered to them at fixed rates. At a time when road transport was coming under some regulation, it was opportune to bear in mind that the railways, as common carriers had for a century been subjected to statutory duties comprehensively providing for the safety and convenience of their employees and the public. As to the fact that 64,000,000 more passengers were carried by the railway in 1934 than in 1933, he said that this recoupment was not wholly at the expense of road traffic, for about 150,000,000 more passengers were carried by omnibuses and coaches, tramcars and trolley vehicles during the year 1933-34 than in the previous twelve months. On the goods side the improvement in trade and industry was reflected in an increased tonnage, particularly of iron and steel, carried by rail, of 19,000,000 tons or 7½ per cent. It was particularly gratifying to notice that there was an increase of 8,750 in the staff employed by the railway companies, the Railway Clearing House, and the London Passenger Transport Board. The canals too, had their best year since the financial crisis of 1931, and conveyed 480,000 tons more traffic than in 1933. It should not be forgotten that about 12,000,000 tons of traffic passed annually by canal, nearly half being coal. It was hoped within five years to eliminate all those weak bridges in the possession of railways and other statutory owners which most seriously affected the free flow of traffic. Priority lists had been prepared by 61 counties out of 93 for the reconstruction of 1,068 bridges. Work on 226 of these was to be put in hand during the current year. There were 1,385 level crossings on classified roads. He hoped that the 75 per cent. grants which were available for work of this nature would induce highway authorities to accelerate progress in their elimination.

Captain A. Hudson, Parliamentary Secretary to the Ministry of Transport, in his reply to the discussion, did not make any more direct reference to railways.

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RAILWAY AND OTHER REPORTS

Bengal-Nagpur Railway.—An interim dividend has been declared for the half-year ended March 31, 1935, of ¼ per cent. on the ordinary stock, payable on July 1, making, together with the guaranteed interest of 1¾ per cent., a distribution of 2 per cent., the same as a year ago.

Rhodesia Railways Trust Limited.—The trust owns *inter alia* over 99 per cent. of the capital of Rhodesia Railways Limited and the Mashonaland Railway Co. Ltd., and all the capital of the Shabani Railway Co. Ltd. The report for the year ended March 31, 1935, shows that the balance at the credit of profit and loss account at March 31, 1934, was £373,919, of which sum the payment on April 30, 1934, of a dividend of 5 per cent. free of income tax, absorbed £100,288, leaving £273,631 to be carried forward. To this sum has been added £93,695, the profit for the year ended March 31, 1935, making a total credit balance on profit and loss account of £367,325. The directors recommend a dividend of 5 per cent., free of income tax, which will absorb £100,288, leaving £267,037 to be carried forward.

Southdown Motor Services Limited.—For the year ended March 31, 1935, this company, which is jointly controlled by the Southern Railway Company and Tilling & British Automobile Traction Limited, secured a gross revenue of £835,346, against £806,552 in the previous year. After deducting £432,038 (against £413,982) for operating and maintenance expenses, £135,244 (against £123,943) for Roads Act duties, rates and taxes, £46,336 (against £44,949) for administration and general expenses, £98,060 (against £120,570) for depreciation, and other items chargeable against revenue, there remains a profit of £113,268 (against £81,158), to which must be added £24,201 (against £20,543) brought forward, making a total of £137,469, compared with £101,701 for the previous year. Out of this amount it is proposed to place £44,000 (against £10,000) to reserve, to pay, as in the previous year, a dividend of 10 per cent. and a bonus of 5 per cent. (making a total distribution of £67,500), and to carry forward £25,969.

British Electric Traction Co. Ltd.—Revenue for the year ended March 31, 1935, amounted to £465,514, against £412,272 for 1933-34, and the net profit, after income-tax, was £299,502, being an increase of £37,476. The directors recommend the payment of dividends at the same rates as for the preceding year—namely, 6 per cent. on the participating preference stock (£42,765), 8 per cent. on the preferred ordinary stock (£106,101), and 5 per cent. on the deferred ordinary stock (£24,549). They further recommend that, as in previous years, a 10 per cent. capital bonus be distributed to the deferred ordinary stockholders in fully paid deferred ordinary shares of £1 each, such shares to be converted subsequently into deferred ordinary stock. This will absorb £49,100 and will entitle the preference stockholders to receive a further dividend of 2 per cent., or £14,255 (again making 8 per cent. for the year), leaving a balance of £62,732 (against £31,952) to be added to undivided profits account. The share of the year's profit available for distribution among the deferred ordinary stockholders amounts to £136,382 (against £98,906).

Nyasaland Railways.—Gross receipts in 1934 amounted to £81,357, against £81,151 in 1933. Working expenses were £46,046, compared with £46,243, and net receipts rose from £34,908 to £35,310. After crediting dividend receipts, &c., and providing for the service of the A debenture stock and income tax, the credit balance carried forward is £1,070 against £1,398.

Atchison, Topeka & Santa Fé Railway.—The report for the year 1934 shows operating revenues of $128,093,947, against $119,826,436 for 1933, with operating expenses of $102,083,479 (against $93,803,317), leaving net operating revenues of $26,010,468, compared with $26,023,118 in 1933. Gross income rose from $16,957,826 to $20,179,850, and net corporate income from $3,698,671 to $7,001,314. The common stock receives a dividend of 2 per cent. for the year 1934, against nil for 1933, and the surplus at December 31, 1934, amounted to $302,466,346.

Wellington, Grey & Bruce Railway.—The estimated earnings for the half-year ending June 30, 1935, applicable to meet interest on the 7 per cent. bonds, will admit the payment of £3 16s. 11d. per £100 bond. This payment will be applied as follows: £1 17s. 6d. in final discharge of coupon No. 105 due on January 1, 1923, and £1 19s. 5d. on account of coupon No. 106 due July 1, 1923, and will be made on July 1 next.

Spencer (George), Moulton & Co. Ltd.—The profits for 1934 amounted to £31,170 (against £9,288 for 1933). Debenture interest and provision for taxation together take £12,878, leaving a balance of £18,292, which has been added to the sum carried forward, raising it to £18,829. The improvement in the home market indicated in last year's report has continued in all departments during the year. The continuance of tariff restriction and embargoes on exchange have prevented the resumption of normal trading conditions in the export market, although a slight improvement took place during the year.

RAILWAY AND OTHER MEETINGS

ANTOFAGASTA (CHILI) & BOLIVIA RAILWAY

The ordinary general meeting of the Antofagasta (Chili) & Bolivia Railway Company was held at Winchester House, Old Broad Street, on June 4, Mr. A. W. Bolden (Chairman and Managing Director) presiding.

The Secretary, Mr. C. Cowley, read the notice convening the meeting and the auditors' report.

In moving the adoption of the report and accounts, the Chairman said that the exchange difficulties which he had mentioned last year as prejudicial to the company's results in spite of better traffics had continued in 1934. Although gross receipts on the railway and waterworks improved by 35·77 per cent., the company received about 8s. to every pound due for currency receipts. Moreover, remittances could not be made freely in the currency of either country concerned.

Tonnage in various classes of freight had advanced during the year, notably in Chile, where articles conveyed for the mining industry rose by 64 per cent., nitrate by 40 per cent., fuel oil by 50 per cent., copper bars by 73 per cent., tin barrilla by 27 per cent., and sulphur by 17 per cent. Bolivian traffic increases were 11 per cent. in tin, 12 per cent. in general merchandise, about 18 per cent. in low grade ores, 30 per cent. in fuel oil, and 31 per cent. in coal. The Chairman considered that industrial conditions in Chile were slowly improving, but most of the new traffic in Bolivia arose from Government requirements.

The board's decision to make no payment on the cumulative preference stock had been reached only after most serious consideration of the circumstances. The directors were determined to pay something at the first moment such a course seemed justifiable, and were exchange conditions in Bolivia to improve before the end of the year they would have no hesitation in paying something on account of arrears of the cumulative preference dividend.

The Chairman had visited Chile during the year and as a result of his negotiations the company was now collecting a surcharge of 66⅔ per cent. on nitrate, instead of only 20 per cent., and of 50 per cent. instead of 20 per cent. on coal and petroleum for the nitrate oficinas. The Government also left it free to collect the full surcharge on other classes of traffic regarding which such payments had from the first been authorised. The Bolivian Government had early this year allowed the company to collect tariffs in sterling on all exported minerals.

Results for the current year showed a decrease to date of £8,000, but currency receipts had actually increased; they were now being converted in Chile at double, and in Bolivia at nearly four times the 1934 rates. Had last year's exchange been maintained an increase would have been shown.

The report and accounts were unanimously adopted.

NOTES AND NEWS

Progress of Railway Bills.—The London & North Eastern Railway Bill and the Southern Railway Bill, which have been through the House of Commons, were read a second time in the House of Lords on Wednesday, June 5.

London Transport Bill.—The London Passenger Transport Board Bill, which was reported, with Amendments, from a Select Committee of the House of Commons on May 23, was read the third time in that House on May 31. It was read a first time in the House of Lords on June 4, and referred to the Examiners.

Last Caledonian Single-driver Locomotive Withdrawn.—The L.M.S.R. announces that the former Caledonian Railway single No. 123 (now No. 14010) has been withdrawn from service, and will be preserved at the St. Rollox Works, Glasgow. This was the last single-driver locomotive to remain in public passenger service in Great Britain, and one of the few survivors of the race to Edinburgh of 1888.

Road Accidents.—The Ministry of Transport return for the week ended June 1 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding week of last year :—

	Killed, including deaths resulting from previous accidents	Injured
England	82 (112)	3,841 (4,345)
Wales	3 (9)	188 (201)
Scotland	13 (13)	434 (422)
	98 (134)	4,463 (4,969)

The total fatalities for the previous week were 94, as compared with 147 for the corresponding period of last year.

G.W.R. Time Signal Changed.—The time signal hitherto radiated throughout the G.W.R. system at 10.0 a.m. for synchronising clocks and watches has been revised. The signal is now transmitted at 11.0 a.m., and the letters " LVN " in Morse Code have been substituted for the " TEN " of the original form. A wireless set has been installed in the company's telegraph office at headquarters so that the electric clock system can be regulated by the B.B.C. time signal at 10.30 a.m. Previously, the time was received over the P.O. lines from Greenwich Observatory.

Mechanical Handling Economies.—Speaking recently at the annual summer meeting of the Institution of Mechanical Engineers, at Bath, Mr. R. B. Lister, Director of R. A. Lister & Co. Ltd., claimed that from earliest times men had constantly been devising improved methods of handling, and that it was here that British industry could now effect the greatest savings and make the best use of improved planning of production and equipment on which so much money had already been spent. " Industry," he said, " is spending hundreds of thousands of pounds a year in wages for work that could be more efficiently done by equipment for the mechanical handling of materials."

Exide Service Convention, 1935.—This convention was held at Eastbourne, with headquarters at the Grand Hotel, from May 28 to 30. Some 800 delegates and guests, representing *inter alia* 11 Dominions or foreign countries, attended and all arrangements were so satisfactory that no hitch whatsoever occurred.

U.S.A. Statistical Bureau Closed.—Mr. Slason Thomson, of the U.S.A. Bureau of Railway News and Statistics, 1957, Daily News Building, Chicago, Ill., has announced that his office was permanently closed on May 31. The publication of the annual " Railway Statistics of the United States of America " has been discontinued with the issue for 1933.

Steel Signal Posts for the L.M.S.R.—The L.M.S.R. announces that British steel will in future be used in preference to timber for the majority of signal posts. Two types will be standardised, a tubular pattern for signals less than 30 ft. above rail level and lattice construction for higher posts. The tubular posts will be painted in alternate bands of black and white, similar to the scheme used for road signs. Substitution will take place as the existing timber posts require replacement.

French Super-Speed Tests.—The P.O.-Midi Railway has been conducting investigations into the resistance of locomotives and rolling stock, and during the course of the experimental runs the rebuilt Pacific engine 3,705 reached a maximum speed of 158 km.p.h. (98·3 m.p.h.) when hauling a trailing load of 158 tonnes, and maintained an average of 153 km.p.h. (95·2 m.p.h.) for 30 km. (18·6 miles) between Orleans and Etampes. With a train of 308 tonnes, the same engine averaged 150 km.p.h. (93·5 m.p.h.) over the 33 km. (20·5 miles) between Chouzy and Vernon.

Hunt's Bank Athletic Festival, L.M.S.R.—The 24th annual athletic festival of the Hunt's Bank (Manchester) staff of the L.M.S.R. was held at Blackpool on June 1. There was an attendance of 12,000 and 12 special trains were run in connection with the event. After an enjoyable and varied programme of sports the prizes were presented by Mrs. L. F. Rowlandson, who was introduced by Mr. F. H. Cowell, Chairman of the Festival. A vote of thanks to Mrs. Rowlandson was proposed by Mr. J. H. Robinson (Divisional Superintendent of Operation, Manchester), and was responded to by Mr. L. F. Rowlandson (Staff Superintendent, L.M.S.R.). The teams from the staffs of the Divisional Superintendent of Operation and the Chief Mechanical Engineer tied for the " Sir Josiah Stamp " Cup, awarded for the highest number of points, but since the former department has held it on the three occasions the cup was handed to the Chief Mechanical Engineer's team. Among the L.M.S. officers present were : Messrs. Ashton Davies, A. F. Bound, A. T. Cotton, E. Taylor.

Railway-organised Press Tour in Ireland.—Under the auspices of the Great Southern Railways, the L.M.S.R. and the G.W.R., a party of members of the London and provincial press recently made an extensive tour in the Irish Free State. A wide area was covered in the space of four days and among the places visited were Dublin, Westport, Clifden, Galway, Limerick, Killarney, Parknasilla, Glengariff, Kenmore, Cork, and Rosslare.

" Hints for Holidays " poster—The Southern Railway is advertising its " Hints for Holidays " guide by means of a poster reproduction of the front-cover design. This, it will be remembered, shows a golden-haired bathing girl burned to a comely terra-cotta at a " Sunshine Line " resort, and beguiling the time with a cigarette before committing herself to the azure depths in the background. The bright colours which have made the guide such an attractive feature of bookstalls are now adding to the gaiety of stations through the medium of the poster.

Alterations at Newcastle Central Station.—Extensive alterations to the existing booking offices are about to be carried out by the L.N.E.R. at the Central station, Newcastle-on-Tyne. The present separate booking offices on each side of the booking hall, the old North British booking office, and the public enquiry office which is situated some distance away, are to be combined and accommodated in a new glass-fronted structure to be erected on part of the area between the two existing booking offices. The ticket issuing windows will be on the left of the booking hall when entering the station from the street, and the enquiry office will be on the right of the main entrance to the station. Show cases will also be erected in the booking hall. Four of the existing stone piers will be removed to afford improved access to the station and to avoid interference with the lighting of the new booking and enquiry office.

Metropolitan Railway Stocks.—Notice is given to those holders of debenture, preference, and consolidated stocks of the Metropolitan Railway Company (except those holders of consolidated stock who elected to change their holdings into Metropolitan Assented Stock) who have not yet delivered up their certificates in accordance with the provisions of the London Passenger Transport Act, 1933, that they are required to deliver up their certificates to the company at its office at 55, Broadway, Westminster, on or before July 31 next. If they fail to do so all

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transport stock and moneys to which they are entitled will be paid by the company into court. Notice is also given that certain holders of debenture stocks of the company are entitled to sums of interest thereon which, owing to non-presentation of interest warrants or otherwise, are still unpaid, and that if such sums are not duly claimed on or before July 31 next they also will be paid into court.

Agreed Charges.—Nineteen more applications for the approval of agreed charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, have been lodged with the Railway Rates Tribunal, as will be seen from the legal notice published on p. 1142. These applications may be inspected at the office of the tribunal, 2, Clement's Inn, Strand, W.C.2, at the Railway Clearing House, London, and at 11 named centres outside London. A copy of each application (1s. post free) may be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street. Notices of objection must be filed with the Registrar of the tribunal on or before June 25.

Northern Ireland Traffics.—For the months of January and February, 1935, on railways wholly in Northern Ireland, the number of passengers (excluding season-ticket holders) was 517,374, compared with 487,872 for the corresponding two months of 1934, and receipts from passengers were £26,844, against £25,884. Merchandise and minerals carried in the two 1935 months were 90,637 tons against 96,432 tons in the two 1934 months, and the total receipts from goods traffic were £29,263 compared with £31,472 in 1934. On railways partly in Northern Ireland passengers numbered 600,367 in the first two months of 1935 against 497,761 in the first two months of 1934, and passenger receipts rose from £45,114 to £48,743. Goods and minerals carried in the first two months of 1935 amounted to 156,167 tons against 157,799 tons, and the total receipts from goods traffic for the 1935 period were £94,830, compared with £92,010 for the corresponding two months in 1934.

G.W.R. Ambulance Gold Medallists' Outing.—G.W.R. ambulance gold medallists selected London as the venue for their thirteenth annual outing, which took place on Saturday, May 25, those participating being members of the staff holding the company's gold medal awards for 15, 20, 25, or 30 years' first-aid efficiency. All parts of the system and all grades of the service were represented when the party of 650, including many members' wives, assembled at Lyons' Corner House for lunch. Among the guests were Mr. J. F. Lean, Principal Assistant to the General Manager, Mr. C. T. Cox, Divisional Superintendent, Mr. A. R. Beatt, Chief Docks Manager's Office, and Miss C. A. Ault, Ambulance Centre Secretary. Telegrams of good wishes were received from Sir James Milne, General Manager, and Mr. W. G. Chapman, late Centre Secretary. A sight-seeing tour of London by coach had been arranged for the afternoon, towards the close of which the party had the pleasure of seeing Their Majesties the King and Queen returning from their drive through the East End. After tea had been taken, the party dispersed, many of them taking an opportunity of seeing more of the city before returning to Paddington *en route* for their home stations. The outing was an extremely enjoyable one, and afforded an opportunity, much appreciated by veterans of the movement, of meeting their old colleagues.

Railway Clerks' Association.—At the annual conference of the Railway Clerks' Association, which was held at Folkestone from May 27 to May 31 inclusive, the following resolution was passed :—" This conference registers its profound dissatisfaction with the present practice of the filling of higher appointments in the railway service. It considers that factors other than ability and length of service operate to the exclusion of capable and deserving applicants. The Conference therefore calls upon the executive committee to take full official cognisance of all flagrant cases reported to them and to take up with the railway companies with a view to the matter being placed on a more equitable basis." A resolution was also carried instructing the executive to submit to the companies a proposal that all clerical staff whose duties involved working on Bank holidays should have another day off. A majority report in favour of a scheme for a socialised transport industry was also adopted.

New road vehicles.—A return, issued by the Ministry of Transport, giving particulars of the number of motor vehicles registered for the first time under the Roads Act, 1920, shows that during the month of March, 1935, the number of new motor vehicles registered was 47,922, compared with 43,735 in March, 1934. The figures for the several classes were :—

	March, 1933	March, 1934
Cars taxed on horse-power	32,950	28,645
Cycles	5,792	6,608
Hackney vehicles	724	636
Goods vehicles	7,280	7,230
Miscellaneous vehicles ...	1,176	616

Copies of the return (price 2s. 6d. net) can be obtained from His Majesty's Stationery Office, Adastral House, Kingsway, W.C.2, or through any bookseller.

Indian State Railways Dinner

The annual Indian State Railways Dinner was held at the Café Monico on June 3, with Sir Hugh Hannay, Kt., V.D., in the chair. Others present were :—

Sir Alan Parsons, K.C.I.E., Mr. A. S. Jameson, Mr. W. T. Tomes, Colonel T. W. Bonner, O.B.E., Sir Seymour Tritton, K.B.E., Mr. Mr. J. M. D. Wrench, C.I.E., Major H. T. B. Reynolds, O.B.E., Capt. R. B. Emerson, R.E., Dr. C. D. Newman, Dr. M. N. Chatterjee, M.R.C.S., L.R.C.P., Messrs. S. T. Gresham, H. Lindars, W. G. Hornett, E. Poultney, Jack Gresham, S. R. G. Gresham, J. E. Bottomley, — L'Evine, L. G. H. Turner, A. E. Williams, O.B.E., V.D., C. I. Routh, G. H. Lamb, — Cartwright, V. P. Bhandakar, T. E. Nagle, L. V. Pont, R. H. Nicolls, O.B.E., F. B. Martin, C. F. Tofts, C. C. Fink, G. W. Dawson, A. Devon, V. H. Boalth, C.B.E., G. S. Bocquet, C.I.E., H. B. Holmes, C.B.E., H. A. Joscelyne, H. D. Creedy, W. M. McGregor, F. S. Bond, R. O. C. Thomson, M.C., J. Shearman, M. N. Varvill, J. Tritton, H. Fereday, A. E. Hughes, and G. W. N. Rose.

After proposing the toasts of " The King " and of " The Queen and the Royal Family," the chairman rose to propose the toast of " The Indian State Railways." Prefacing his remarks with some amusing reminiscences of the good old days in India, he turned to the more serious topic of dealing briefly with the Government of India Bill as it affected Indian railways. All present must, he thought, have studied the proposals for a Statutory Railway Board with interest and not a little apprehension. The vital clauses were those safeguarding the new board against political interference, and everyone hoped they would have the desired effect. He proposed this toast with pride in the past, mixed with sympathy with those still serving in India.

In proposing the health of Mr. H. B. Holmes, the Honorary Secretary of the Dinner, Mr. Jameson (President of the Dinner Committee) gave a brief history of these dinners. Originating as a North Western Railway Dinner in 1905, with a formidable committee, the first dinner was held at the Café Royal, but in 1906 they moved to the Monico and had held all subsequent dinners there. Mr. Holmes, he said, had taken on the secretaryship in 1920 and had run this pleasant annual function splendidly ever since. In token of their esteem he then presented Mr. Holmes with a handsome inkstand on behalf of the members. The toast was drunk with musical honours. Mr. Holmes expressed his thanks in a suitable reply and proposed the healths of Mr. Jameson, the President, and Sir Hugh Hannay, Chairman.

About 10 p.m. Sir Hugh again rose and said he had just received an important telegram. He had, he explained, sent the following message earlier in the evening :—

Equerry, Buckingham Palace.
The officers of the Indian State Railways dining here tonight at the Monico Restaurant loyally and respectfully beg to send their greetings to His Majesty the King.
Chairman, I.S.R., Annual Dinner.

The telegram that had just been handed to him read as follows :—

O.H.M.S., Buckingham Palace.
Chairman, Indian State Railways, Monico Restaurant.
The message of good wishes contained in your telegram was much appreciated by the King, whose sincere thanks I am commanded to convey to you and all who joined in these congratulations.
Clive Wigram.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 22nd Week			Totals to Date		
	1935	1934	Inc.or Dec.	1935	1934	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,926¼ mls.)						
Passenger-train traffic...	466,000	467,000	– 1,000	9,057,000	9,022,000	+ 35,000
Merchandise, &c. ...	467,000	455,000	+ 12,000	9,843,000	9,769,000	+ 74,000
Coal and coke ...	217,000	197,000	+ 20,000	5,372,000	5,378,000	– 6,000
Goods-train traffic ...	684,000	652,000	+ 32,000	15,215,000	15,147,000	+ 68,000
Total receipts	1,150,000	1,119,000	+ 31,000	24,272,000	24,169,000	+ 103,000
L.N.E.R. (6,336 mls.)						
Passenger-train traffic...	294,000	292,000	+ 2,000	5,922,000	5,851,000	+ 71,000
Merchandise, &c. ...	333,000	299,000	+ 34,000	6,778,000	6,850,000	– 72,000
Coal and coke ...	221,000	214,000	+ 7,000	5,079,000	5,207,000	– 128,000
Goods-train traffic ...	554,000	513,000	+ 41,000	11,857,000	12,057,000	– 200,000
Total receipts	848,000	805,000	+ 43,000	17,779,000	17,908,000	– 129,000
G.W.R. (3,749¼ mls.)						
Passenger-train traffic...	187,000	196,000	– 9,000	3,762,000	3,797,000	– 35,000
Merchandise, &c. ...	201,000	193,000	+ 8,000	3,944,000	3,906,000	+ 38,000
Coal and coke ...	98,000	95,000	+ 3,000	2,239,000	2,262,000	– 23,000
Goods-train traffic ...	299,000	288,000	+ 11,000	6,183,000	6,168,000	+ 15,000
Total receipts	486,000	484,000	+ 2,000	9,945,000	9,965,000	– 20,000
S.R. (2,171 mls.)						
Passenger-train traffic...	290,000	291,000	– 1,000	5,667,000	5,602,000	+ 65,000
Merchandise, &c. ...	71,500	71,000	+ 500	1,313,000	1,395,000	– 82,000
Coal and coke ...	31,500	26,000	+ 5,500	695,000	731,000	– 36,000
Goods-train traffic ...	103,000	97,000	+ 6,000	2,008,000	2,126,000	– 118,000
Total receipts	393,000	388,000	+ 5,000	7,675,000	7,728,000	– 53,000
Liverpool Overhead ... (6½ mls.)	1,180	1,103	+ 77	24,457	23,978	+ 479
Mersey (4½ mls.) ...	3,819	3,879	– 60	89,491	91,708	– 2,217
*London Passenger Transport Board ...	556,400	551,300	+ 5,100	25,768,200	25,224,900	+ 543,300
IRELAND						
Belfast & C.D. pass. (80 mls.)	2,369	2,151	+ 218	42,828	41,191	+ 1,637
,, ,, goods	578	605	– 27	10,994	11,751	– 757
,, ,, total	2,947	2,756	+ 191	53,822	52,942	+ 880
Great Northern pass. (543 mls.)	10,100	9,650	+ 450	190,850	174,600	+ 16,250
,, ,, goods	12,000	11,050	+ 950	198,650	191,200	+ 7,450
,, ,, total	22,100	20,700	+ 1,400	389,500	365,800	+ 23,700
Great Southern pass. (2,124 mls.)	22,259	24,132	– 1,873	449,976	443,464	+ 6,512
,, ,, goods	32,132	33,397	– 1,265	771,912	713,181	+ 58,731
,, ,, total	54,391	57,529	– 3,138	1,221,888	1,156,645	+ 65,243

* 48th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes.

Swedish Private Railway Results

The private railway companies in Sweden report much better results for 1934 than for 1933. The Trafikfoervaltningen Goeteborg-Dalarna-Gaefle group announce a surplus of Kr. 8,600,000 compared with Kr. 5,550,000 for 1933. Bergslagernas Jaernvaegsaktiebolag, which forms part of that group, will be able to pay a dividend of 3 per cent. for 1934, as in 1931; no dividend was paid for 1932 and 1933. Another company belonging to the same combine, Soedra Dalarnes Jaernvaegsaktiebolag, will pay a dividend of 4 per cent., not only for 1934, but also for the two previous years, when there was no dividend. Last year 39 companies were able to realise profits, against 32 in 1933. Earnings for all the 94 companies together were Kr. 112,630,000 compared with Kr. 99,410,000 in 1933, practically the whole of the increase being in goods transport. The surplus of earnings over expenditure was Kr. 26,820,000, compared with Kr. 17,750,000 in 1933, and a net profit for all the companies after deductions for renewal funds, &c., was Kr. 7,050,000, compared with a loss of Kr. 1,890,000. The quantity of goods transported during the year was 17,700,000 tons compared with 14,440,000 in 1933, and the number of passengers 31,940,000 compared with 30,860,000.

Forthcoming Events

June 12 (*Wed.*).—Institution of Civil Engineers. Great George Street, London, S.W.1, Conversazione.

June 20 (*Thurs.*)—Institution of Electrical Engineers, at Natural History Museum, Cromwell Road, London, S.W. 7, 8.30 p.m. Conversazione.

June 21–25.—Institution of Railway Signal Engineers, in Belgium. Summer Meeting.

June 25 (*Tues.*)—Retired Railway Officer's Society. Summer Outing.

July 6–11.—Permanent Way Institution, at Glasgow. Summer Convention.

July 9 (*Tues.*)—Retired Railway Officers' Society, at Great Eastern Hotel, Liverpool Street, London, E.C. 2, 2.30 p.m. Ordinary Meeting.

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices June 5, 1935	Rise/ Fall
G.W.R.				
Cons. Ord. ...	66½	48½	48	–½
5% Con. Prefce. ...	118	109	119	—
5% Red. Pref. (1950)	115	107	111½	—
4% Deb.	117	105	115½	—
4½% Deb.... ...	119	109	116½	—
4½% Deb.... ...	129½	115¼	125½	—
5% Deb.	135	126¼	137½	—
2½% Deb.... ...	75	64	78½	—
5% Rt. Charge ...	134 7/16	123¼	135½	—
5% Cons. Guar. ...	132⅝	121⅝	130½	—
L.M.S.R.				
Ord.	30½	19⅛	18½	+½
4% Prefce. (1923)	64¼	41	52½	+1½
4% Prefce. ...	87	69½	79½	—
5% Red. Pref. (1955)	107	92½	102½	—
4% Deb.	114⅛	100½	108½	—
5% Red. Deb. (1952)	118 11/16	111¼	115½	—
4% Guar.	106½	96⅝	103	—
L.N.E.R.				
5% Pref. Ord. ...	24⅜	13⅛	11½	+½
Def. Ord.	11½	6⅞	6⅛	+⅜
4% First Prefce. ...	76	59½	59½	—
4% Second Prefce.	47	25½	23	+1
5% Red. Pref. (1955)	94½	80	80⅛	—
4% First Guar. ...	104	92	100½	—
4% Second Guar.	97⅞	86½	92½	–½
3% Deb.	90	74½	83	—
4% Deb.	114	99¼	107½	—
5% Red. Deb. (1947)	117	108	113½	—
4½% Sinking Fund Red. Deb.	111¼	105¼	111	—
SOUTHERN				
Pref. Ord.... ...	90	63⅛	84	–1
Def. Ord.	32⅝	19	24	+1
5% Prefce. ...	118 13/16	107½	119	–½
5% Red. Pref. (1964)	115⅝	107⅛	115⅛	—
5% Guar. Prefce.	132	120⅝	130	—
5% Red. Guar. Pref. (1957)	119½	113	118½	—
4% Deb.	116½	103¼	114½	—
5% Deb.	134	124 13/16	135½	—
4% Red. Deb. 1962–67	113 11/16	105 9/16	112½	—
BELFAST & C.D.				
Ord.	6	5	—	—
FORTH BRIDGE				
4% Deb.	110	100	109½	—
4% Guar.	110	100	108½	—
G. NORTHERN (IRELAND)				
Ord.	9⅝	4 15/16	9	—
G. SOUTHERN (IRELAND)				
Ord.	25	12½	27½	+2½
Prefce.	21½	13 15/16	32	—
Guar.	48	39	65	—
Deb.	67	59	79	+1
L.P.T.B.				
4½% "A" ...	126	115	124 1/8*	–1
5% "A"	135½	124½	133 1/2*	–2
4½% "T.F.A." ...	113½	107½	111*	–1
5% "B"	131⅝	118	127 1/8*	–2
"C"	97	73	100	—
MERSEY				
Ord.	15¼	7	12	—
4% Perp. Deb. ...	93½	82½	95⅛	—
3% Perp. Deb. ...	66½	61½	69½	—
3% Perp. Prefce....	54	44½	52⅛	—

* ex-dividend

LEGAL AND OFFICIAL NOTICES

In the Court of the Railway Rates Tribunal.

Road and Rail Traffic Act, 1933. Agreed Charges.

NOTICE IS HEREBY GIVEN that applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933 short particulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The said Applications may be inspected at the Office of the Tribunal, 2, Clement's Inn, Strand, London, W.C.2, at any time during office hours and at the following places :—

LONDON : Railway Clearing House, 123, Seymour Street, N.W.1.

BIRMINGHAM : District Goods Manager's Office, Snow Hill, Great Western Railway.

CARDIFF : Divisional Superintendent's Office, Great Western Railway.

EXETER : Western Divisional Superintendent's Office, Southern Railway.

LEEDS : District Goods Manager's Office, Wellington Street, London & North Eastern Railway.

LEICESTER : District Goods and Passenger Manager's Office, London Midland & Scottish Railway.

MANCHESTER : District Goods Manager's Office, Hunt's Bank, London Midland & Scottish Railway.

SOUTHAMPTON : Southern Divisional Superintendent's Office, Southampton West, Southern Railway.

YORK : Goods Manager's Office, London & North Eastern Railway.

ABERDEEN : District Goods and Passenger Manager's Office, London Midland & Scottish Railway.

EDINBURGH : District Goods and Passenger Manager's Office, Waverley Station, London & North Eastern Railway.

GLASGOW : Commercial Manager's Office, Central Station, London Midland & Scottish Railway.

A copy of each Application lodged with the Tribunal can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, Westminster, London, S.W.1, price 1s., post free.

Notices of objection by any parties entitled to object to the approval of any of the said Agreed Charges must state concisely the grounds of objection and must be filed at the office of the Registrar, 2, Clement's Inn, Strand, London, W.C.2, on or before the 25th day of June, 1935, and a copy thereof on or before the same day served on or sent by registered post to Mr. G. Cole Deacon, at the above address. A separate Notice must be filed and served in respect of each Application.

Each Notice filed must be on foolscap size paper and must be stamped with an adhesive fee stamp for 2s. 6d. (which can be purchased at the office of the Tribunal only). If sent by post for filing each Notice must be accompanied by a Postal Order for 2s. 6d. payable to the Registrar, when a stamp will be affixed at the office. A Notice by a Representative Body of Traders must contain a statement of the facts upon which such Body claims to represent a substantial number of traders interested in, or likely to be affected by the decision on, the application.

Four additional copies of each Notice must be lodged with the original at the office of the Registrar.

T. J. D. ATKINSON,
Registrar.

3rd June, 1935.

Number of Application and Date of Lodgment	Parties to Agreement	Nature of Agreed Charge
1935. No. 155—May 31, 1935	CARLTONA LIMITED, Victoria Road, Willesden Junction, London, N.W.10, and the G.W., L.M. & S., L. & N.E., and Southern Railway Companies	Per ton. Confectionery ; Groceries, such as those included in Exceptional Rate Lists G and H, as defined in the General Classification of Merchandise ; Empties returned to Suppliers.
1935. No. 156—May 31, 1935	IAN D. GOLDSWORTH & CO., Cornboro' Place, Bridgwater Somerset, and the G.W. Railway Company and the Somerset and Dorset Joint Committee	Per ton. Woven Fabric Furniture and Wickerwork.
1935. No. 157—May 31, 1935	F. C. LOWE & SON LTD., "Carta Carna" Works, Sittingbourne, and the Southern Railway Company	Per ton. Dog Biscuits and Foods for Livestock or Poultry.
1935. No. 158—May 31, 1935	MALGA (LONDON) LIMITED, Southall, Middlesex, and the G.W. Railway Company..	Per ton. Confectionery and Fondant Sugar.
1935. No. 159—May 31, 1935	MARS CONFECTIONS LIMITED, Trading Estate, Slough, and the G.W. Railway Company	Per ton. Confectionery.
1935. No. 160—May 31, 1935	NEWTON CHAMBERS & CO. LTD., Thorncliffe, nr. Sheffield, and the L. & N.E. and L.M. & S. Railway Companies	Per ton. Disinfectant, Disinfectant Liquid Soap, Fumigating Pastilles, Hair Washes, Izal Lozenges and Mints, Shaving Cream, Soap, Spraying Machines, Sulphur Candles, Sweeping Powder, Toilet Paper Holders ; Advertising Matter ; Empty tins, drums and bottles ; Toilet Paper in mixed consignments with other goods as herein defined.
1935. No. 161—May 31, 1935	BELAM & BRINLEY, Collins Road, Totnes, and the G.W. Railway Company	Per ton. Rabbits (dead).
1935. No. 162—May 31, 1935	EMPIRE STORES LIMITED, Canal Road, Bradford, and the L. & N.E. and L.M. & S. Railway Companies	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 163—May 31, 1935	SAML. HANSON & SON LTD., 14, Eastcheap, London, E.C.3, and the G.W., L. & N.E., L.M. & S. and Southern Railway Companies	Per package. Confectionery, Groceries, Preserves, Advertising Matter and Travellers' Stationery.
1935. No. 164—May 31, 1935	R. & J. HILL LIMITED, Spinet House, 175, Shoreditch, London, E.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Companies	Per package. Cigarettes and Tobacco.
1935. No. 165—May 31, 1935	WILLIAM HOLLINS & CO. LTD., Viyella House, Nottingham, and the L. & N.E. and L.M. & S. Railway Companies	Per package. Garments, Hosiery, Knitting Yarn and Advertising Matter.
1935. No. 166—May 31, 1935	INTERNATIONAL HARVESTER COMPANY OF GREAT BRITAIN LIMITED, Harvester House, 259, City Road, London, E.C.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Companies	Per package. Small Parts of Agricultural Machinery and Motor Trucks, and Advertising Matter.
1935. No. 167—May 31, 1935	GORDON MACKAY & CO. (LEEDS) LTD., Gomaco House, Armley Road, Leeds, and the L. & N.E. and L.M. & S. Railway Companies	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 168—May 31, 1935	G. ROBINSON & SON (CORNWALL) LTD., Camelford, Cornwall, and the G.W. and Southern Railway Companies	Per ton. Rabbits (dead).
1935. No. 169—May 31, 1935	THE SHIELDS ICE & COLD STORAGE CO. LTD., North Shields, and the L. & N.E. Railway Company	Per package. Preserved Food, Preserved Fruits, Cordials and Advertising Matter.
1935. No. 170—May 31, 1935	THE VICTORIA CREAMERY CO. LTD., Airdrie, and the L. & N.E. and L.M. & S. Railway Companies	Per package. Bakers' Filling Cream, Confectionery for Cakes, and Spice.
1935. No. 171—May 31, 1935	W. WILLIAMS & SON (BREAD STREET) LTD., 53 & 54, Bread Street, London, E.C.4, and the G.W., L. & N.E., L.M. & S. and Southern Railway Companies	Per package. Belts, Braids, Buttons, Fancy Handkerchiefs, Feather Neckwear, Fringes, Furs, Fur Coats, Haberdashery, Knitted Sports Wear, Ladies' Hand Bags and Trimmings.
1935. No. 172—May 31, 1935	I. E. TRENT & CO. LTD., 10, Oat Lane, Wood Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Companies	Per package. Textiles.
1935. No. 173—June 1, 1935	THE MIDLAND BACON FACTORY LIMITED, The Cross, Clowne, nr. Chesterfield, and the G.W., L. & N.E., L.M. & S. and Southern Railway Companies, and L.P.T.B.	Per pig. Live pigs consigned to the Trader or his Agents.

Sudan Government

SUDAN RAILWAYS require the services of a LOCOMOTIVE FOREMAN, age 25-30, single preferred. Candidates should have served apprenticeship as fitter in railway locomotive works and have had subsequent running shed experience.

Commencing salary £E400 per annum with biennial increases of £E20 up to a maximum of £E520 per annum (£E1 = £1 0s. 6d.). Contemplated period of service 7-10 years, including 12-18 months' probation. Provident Fund benefits on termination of contract according to terms of Sudan Provident Fund Ordinance. Strict medical examination. Free passage on appointment.

Applications, giving full particulars of age, qualifications and experience, with copies of testimonials, should be sent to the Controller, Sudan Government London Office, Wellington House, Buckingham Gate, London, S.W.1, marking envelope "Locomotive Foreman."

Canadian National Railway Company

WELLINGTON GREY & BRUCE RAILWAY COMPANY, 7 PER CENT. BONDS.

AT the semi-annual ballot for May, 1935, the following Wellington Grey & Bruce Railway Company 7 per cent. Bonds were drawn and will be paid at par at the offices of the Canadian National Railway Company in Montreal, Canada, or at Orient House, 42/5, New Broad Street, London, E.C.2, England, on the 1st July next, that is to say, Bonds numbered : 99, 295, 344, 467, 472, 652, 743, 1012, 1148, 1234, 1429, 1661, 1676, 1725, 1750, 1810, 1873, 1931, 2142, 2192, 2218, 2251, 2306, 2393, 2662, 2676, 2729, 2819, 2839, 2984, 3176, 3205, 3332, 3435, 3441, 3443, 3750, 3787, 3845, 4015, 4051, 4065, 4310, 4341, 4369, 4379, 4693, 4781, 4916, 5146.

In all £5,000 sterling.

Holders of these Bonds will take notice that the interest will cease after 1st July next.

A. H. CONEYBEARE,
European Secretary and Treasurer.

London. 3rd June, 1935.

Canadian National Railway Company

WELLINGTON GREY & BRUCE RAILWAY COMPANY, 7 PER CENT. BONDS.

NOTICE IS HEREBY GIVEN that the estimated earnings of the Wellington Grey & Bruce Railway for the half-year ending 30th June, 1935, applicable to meet interest on the Bonds, will admit of the payment of £3 16s. 11d. per £100 Bond, and that this payment will be applied as follows, viz. :—

£1 17s. 6d. in final discharge of Coupon No. 105 due 1st January, 1923, and £1 19s. 5d. on account of Coupon No. 106 due 1st July, 1923 and will be made on and after 1st July next at the offices of the Canadian National Railway Company, Orient House, 42/5, New Broad Street, London, England.

The coupons must be left three clear days for examination.

A. H. CONEYBEARE,
European Secretary and Treasurer.

London. 3rd June, 1935.

Official Notices—*continued*

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for :—

8 BOILERS for K Class Compound Engines.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Tuesday, 4th June, 1935.

A fee of 20s. will be charged for each copy of the specification, which is not returnable.

Tenders must be submitted not later than noon on Wednesday, 26th June, 1935.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
P. W. GIBBS,
Assistant Secretary.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Central Argentine Railway Limited.

NOTICE IS HEREBY GIVEN that the Transfer Books of the 4 per cent. Debenture Stock and the 3½ per cent. Central Debenture Stock will be closed from 8th to 20th June, both days inclusive, for the preparation of Warrants for Interest for the half year ending 30th June, 1935.

F. FIGHIERA,
Secretary.

3A, Coleman Street,
London, E.C.2.
5th June, 1935.

CONTRACTS AND TENDERS

Large Scheme for London Railway Electrification and Improvement

The Chancellor of the Exchequer announced in the House of Commons on Wednesday that long negotiations between the Government, the Standing Joint Committee of the London Passenger Transport Board and the main line railways had resulted in an agreement upon an extensive programme of electrification and improvement of London and suburban transport. The Government's credit will be used. The work is estimated to cost £35,000,000 and is to be completed in five years. It includes electrification of certain of the L.N.E.R. suburban lines converging on Liverpool Street and further lines in North London ; new tube railways and extensions ; and electrification and widening of G.W.R. tracks from North Acton to Ruislip. Further details are given on pages 1133–1135 of this issue.

New Coaches for L.N.E.R.

The L.N.E.R. has placed orders with R. & Y. Pickering & Co. Ltd. for 26 bogie first- and third-class composite semi-corridor coaches with vacuum brake equipment, and with Craven's Railway Carriage & Wagon Co. Ltd. for 23 coaches of the same type with vacuum brake equipment together with a further three otherwise similar coaches, but fitted with dual Vacuum and Westinghouse brake equipment. These coaches are required for the Great Eastern section East Anglian services.

The Mercury Truck & Tractor Co. Ltd. has received an order for two Mercury petrol-driven platform trucks for workshop use for the Buenos Ayres Great Southern Railway.

A contract for the construction of an electrified railway and a port on the Black Sea will shortly be awarded to the Metropolitan-Vickers Electrical Co. Ltd., according to a report from Angora, the Turkish capital, states Reuters. This follows a long interview which the Minister of Public Works had with representatives of Metropolitan-Vickers, the report adds. The plan is stated to provide for a modern port at Heraclea, on the south shore of the Black Sea, linked by an electric railway with the town of Zongouldak, about 25 miles away. Reference to the scheme was made on page 283 of our issue of August 17 last.

Beyer, Peacock & Co. Ltd. has received an order from the Briton Ferry Steel Co. Ltd. for one heavy saddle-tank locomotive of the 0-4-0 type with outside cylinders 16 in. by 24 in. and 3-ft. 10-in. diam. coupled wheels.

New Coaches for London Passenger Transport Board

The London Passenger Transport Board has placed orders for a total of four six-car trains and four spare cars required for the District Line extended services to Barking, and divided as follow :—Birmingham Railway Carriage & Wagon Co. Ltd. : 14 motor-third composite coaches, nine first- and third-class composite trailer coaches, and five third-class trailer coaches. The General Electric Co. Ltd. : 28 traction motors ; British Thomson-Houston Co. Ltd. : 14 electric control equipments for the motor coaches.

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the London Passenger Transport Board for 26 first- and third-class steel composite trailer coaches for service on the District lines.

The Egyptian State Railways Administration has placed orders as follow :—

Electric Constructions Co. Ltd. : Transformers (E.S.R. 13,290, price £368).
J. W. Beresford & Co. Ltd. : Numeral transfers (E.S.R. 60,126, price £290 5s.).
Associated Lead Manufacturers' Export Co. Ltd. : Red lead (E.S.R. 60,127, price £295 5s. 2d.).
British Power & Tyers Signal Co. Ltd. : Signalling materials (E.S.R. 24,99 (1), price £130 10s.).
S. A. Gilsoco : 110 metric tons of bolts and nuts for fishplates (E.S.R. 302G 3/6 (A), price L.E.12.012 mills per metric ton).
H. J. Skelton & Co. Ltd. : 636 metric tons saddles for rails (E.S.R. 302G 3/6 (C), price £9 15s. per metric ton).
David Moseley & Sons Ltd. : Hose pipes.
Fried Krupp, A.G. : Helcal springs.
Tees Side Bridge & Engineering Co. Ltd. : Buffer rods.
Steel, Peech & Tozer Limited : Steel tyres.
Ericsson Telephones Limited : Switchboards (E.S.R. 34.370, items 1 and 2, price £394 10s.).
Standard Telephones & Cables Limited : Switchboards (E.S.R. 34.370, item 5, price £229 7s. 6d.).

The Bombay, Baroda & Central India Railway Administration has placed the following orders, to the inspection of Messrs. Rendel, Palmer & Tritton :—

Patent Shaft & Axletree Co. Ltd. : 400 carriage and wagon axles.
Bochumer Verein A.G. : 2,845 helical springs and 350 locomotive tyres.
John Spencer Limited : 750 laminated wagon springs.
Banting Tresilian Limited : 6,100 steel boiler tubes and 48 flue tubes.
Blaenavon Co. Ltd. : 650 carriage and wagon tyres.
Nicholson & Fieldsend Limited : 656 helical springs for bogie trucks.
Vacuum Brake Co. Ltd. : Vacuum brake parts for coaching stock and for 50 bogie timber trucks.

The South African Railways & Harbours Administration is enquiring for tenders for the supply of 72 electric coaches for suburban services.

The Bengal-Nagpur Railway invites tenders, receivable by June 26, at 132, Gresham House, Old Broad Street, London, E.C.2, for eight boilers for K class compound engines.

The Tilley Lamp Company has received repeat orders for the supply of six Tilley floodlight projectors, each to the New Zealand Government Railways and the Palestine Railways.

The Great Western Railway has recently placed orders as follow :—

E. C. & J. Keay (1926) Limited : Footbridge and platform covering for Briton Ferry.
A. C. Welding Co. Ltd. : Two single-operator and one double-operator A.C. welding plants.
J. Bennie & Sons Ltd. : One punching and shearing machine.
Denhams Engineering Co. Ltd. : One engine lathe.
Kitchen & Wade Limited : Two radial drilling machines.
T. White & Sons Ltd. : One tenoning machine.

The whole of the machine tools and the welding equipment here enumerated are required for the Swindon works.

Craven's Railway Carriage & Wagon Co. Ltd. has received an order from the Ford Motor Co. Ltd. for one 50-ton bogie pig-iron car, one four-wheeled flue-dust car, and one four-wheeled hot-metal clean-up car for use in the Ford works at Dagenham.

The South Indian Railway Administration has placed orders to the inspection of Messrs. Robt. White & Partners with the Edison Standard Batteries Distributors Limited for 228 alkaline cells for train-lighting and with the English Steel Corporation for 50 carriage and wagon axles and two locomotive straight axles.

The Chinese Government Purchasing Commission, on behalf of the Ministry of Railways, China, has placed the following orders to the inspection of Messrs. Fox & Mayo :—Henry Berry & Co. Ltd. : One locomotive burring press ; and Cowans, Sheldon & Co. Ltd. : Locomotive and tender lifting jacks.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Miscellaneous Section), Simla, receivable by July 1, for the supply of metallic body fittings for railway carriages for the E.I., E.B., G.I.P., and N.W. Railways on a running-contract basis during the year September 16, 1935–September 15, 1936.

XUM

Railway Share Market

The stock and share markets have reported a fair amount of activity notwithstanding the attractions of Epsom, which is in this week a traditional competitor with the Stock Exchange for interest. Home railway stocks are still more or less under the cloud of uncertainty set up by the reports that the employees are to make a claim for full restoration of the "cuts" in wages. Whilst any developments in this matter would not, in any case, mature for many months, the fact that it is hovering over the market tends to keep off new buyers.

Meanwhile, there is some hope that the interim statements, due to be issued on July 25 and 26, may instil new life into the market. Before that date, however, the L.M.S. will have to make an important decision as to the half-year's dividend due on July 1 on the 5 per cent. redeemable preference stock of 1955. This stock ranks *pari passu* with the 4 per cent. preference stock and the half-yearly payment of the half-yearly dividend on the former would imply the due payment of the half-year's dividend on the 4 per cent. stock. Last year the question of payment was deferred until the directors met in mid-July for consideration of the interim statement, but this year the directors are anticipating the punctual payment of the full half-year's dividend of 2½ per cent., followed by the full half-year's payment on the 4 per cent. preference stock when it falls due in August.

The traffic receipts for the past week, which showed an increase on all four lines, had a favourable influence on the market on Wednesday, although Southern stocks, which should have normally benefited from the Derby week traffic, were inclined to dullness later owing to the inclement weather conditions.

In foreign railways little of importance has transpired to affect prices. Cordoba Central debenture stock has come back sharply on realisation of profits by earlier speculative buyers and the absence of any authoritative news about the negotiations with the Argentine Government. Leopoldina Terminal debentures had a sharp fall on the offer of a little stock and business was marked at only 42 as against a highest of 59 this year. Brazilian stocks were generally on the weak side, and among nitrate issues Taltal Railway shares sustained a fall.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1934-35	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1934	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1934	Prices: Lowest 1934	Prices: June 5, 1935	Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	2.6.35	12,690	+ 860	22	272,210	279,560	— 7,350	Ord. Stk.	26⅝	19	19½	Nil
	Argentine North Eastern ..	753	1.6.35	9,175	+ 1,151	48	358,863	394,863	— 36,000	,,	11	6⅞	7	Nil
	Argentine Transandine ..	111	—	—	—	—	—	—	—	A. Deb.	52	45	32½	12 5/16
	Bolivar	174	Apl., 1935	6,750	+ 350	17	26,300	27,050	— 750	6 p.c. Deb.	10	6½	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	13⅝	10 7/16	13	3 15/16
	Buenos Ayres & Pacific ..	2,806	1.6.35	87,750	+ 11,415	48	3,822,676	4,105,788	— 283,112	Ord. Stk.	16½	8½	7½	Nil
	Buenos Ayres Central ..	190	12.5.35	$114,300	+ $7,500	45	$4,934,300	$4,780,600	+ $153,700	Mt. Deb.	23	10	21½	Nil
	Buenos Ayres Gt. Southern	5,085	1.6.35	116,372	— 5,340	48	6,887,475	7,461,663	— 574,188	Ord. Stk.	35	22	24	Nil
	Buenos Ayres Western ..	1,930	1.6.35	44,170	+ 1,379	48	2,180,592	2,527,591	— 346,999	,,	27½	18½	18½	Nil
	Central Argentine	3,700	1.6.35	126,098	— 4,120	48	5,846,425	6,295,486	— 449,061	,,	23	13½	14½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	14	7	7	Nil
	Cent. Uruguay of M. Video	273	1.6.35	10,653	— 5,954	48	648,594	787,757	— 139,163	Ord. Stk.	15½	8	5½	Nil
	Do. Eastern Extn.	311	1.6.35	1,873	— 1,633	48	93,093	163,603	— 70,510	—	—	—	—	—
	Do. Northern Extn.	185	1.6.35	1,749	— 344	48	54,204	92,278	— 38,074	—	—	—	—	—
	Do. Western Extn.	211	1.6.35	643	— 941	48	35,868	74,496	— 38,628	—	—	—	—	—
	Cordoba Central	1,218	1.6.35	26,970	— 660	48	1,342,950	1,555,730	— 212,780	Ord. Inc.	6	3	2	Nil
	Costa Rica	188	Apl., 1935	13,045	— 1,659	43	162,371	181,164	— 18,793	Stk.	30⅝	23½	32	6¼
	Dorada	70	Apl., 1935	10,700	+ 1,100	17	44,100	41,100	+ 3,000	1 Mt. Db.	103	95	104½	5⅜
	Entre Rios	810	1.6.35	11,195	+ 603	48	581,215	577,834	+ 3,381	Ord. Stk.	21½	12	12½	Nil
	Great Western of Brazil ..	1,082	1.6.35	5,000	— 100	22	191,000	184,400	+ 6,600	Ord. Sh.	⅞	⅝	½	Nil
	International of Cl. Amer.	794	Apl., 1935	$455,976	— $12,489	17	$1,763,588	$1,991,549	— $227,961	—	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	1/-	1/-	½	Nil
	La Guaira & Caracas ..	22⅝	Apl., 1935	4,960	+ 1,490	17	15,500	14,380	+ 1,120	Stk.	12⅝	7⅝	8½	Nil
	Leopoldina	1,918	1.6.35	18,287	+ 785	22	479,972	466,369	+ 13,603	Ord. Stk.	14⅝	7	5	Nil
	Mexican	483	31.5.35	$334,500	+ $48,400	21	$5,239,800	$4,955,800	+ $284,000	,,	3¼	1½	1½	Nil
	Midland of Uruguay ..	319	Apl., 1935	6,362	— 1,230	43	97,748	95,108	+ 2,640	,,	1½	½	1½	Nil
	Nitrate	401	31.5.35	3,792	— 971	21	58,925	69,284	— 10,359	Ord. Sh.	32 9/32	51/-	2¼	Nil
	Paraguay Central	274	1.6.35	$1,924,000	+ $872,000	48	$56,759,000	$35,879,000	+ $20,880,000	Pr. Li. Stk.	84	67	60½	9 15/16
	Peruvian Corporation ..	1,059	May, 1935	71,815	+ 9,303	48	697,276	¢19,408	+ 77,868	Pref.	14½	8	8	Nil
	Salvador	100	25.5.35	¢16,600	— ¢2.825	47	¢988,827	¢1,004,058	— ¢15,231	Pr. Li. Db.	75	70	65	7 11/16
	San Paulo	153½	26.5.35	24,937	+ 427	21	528,221	579,323	— 51,102	Ord. Stk.	86	67	57	4⅝
	Taltal	164	Apl., 1935	4,500	+ 2,875	43	31,385	24,072	+ 7,313	Ord. Sh.	2⅛	1 7/16	1¼	8
	United of Havana	1,365	1.6.35	21,177	+ 6,536	48	1,119,021	922,220	+ 196,801	Ord. Stk.	6	2	2½	Nil
	Uruguay Northern	73	Apl., 1935	891	— 70	43	10,726	11,507	— 781	Deb. Stk.	6¼	3	4½	Nil
Canada.	Canadian National	23,735	21.5.35	629,884	— 45,593	20	12,369,779	12,180,392	+ 189,387	—	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	78¼	51⅛	59½	6⅝
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104½	97¼	100½§	3 16/16
	Canadian Pacific	17,211	31.5.35	659,600	+ 600	21	9,267,600	9,440,200	— 172,600	Ord. Stk.	18 5/16	11 1/16	11	Nil
India.†	Assam Bengal	1,329	10.5.35	31,410	— 7,035	5	129,435	162,077	— 32,642	Ord. Stk.	88½	72	83½	3 9/16
	Barsi Light	202	10.5.35	3,420	— 1,920	5	15,472	18,307	— 2,835	Ord. Sh.	104½	98¼	35⅛	5⅜
	Bengal & North Western ..	2,114	20.5.35	78,670	— 4,932	6	380,949	405,944	— 24,995	Ord. Stk.	297½	262	297½	5⅜
	Bengal Dooars & Extension	161	10.5.35	2,984	— 359	5	12,139	13,319	— 1,180	,,	125¼	124	124½	5⅝
	Bengal-Nagpur	3,268	30.4.35	184,425	+ 13,615	4	538,875	508,571	+ 30,304	,,	105½	96	102½	3⅞
	Bombay, Baroda & Cl. India	3,072	31.5.35	267,825	— 8,025	7	1,480,125	1,479,675	+ 450	,,	115	108½	114½	5¼
	Madras & South'n Mahratta	3,230	10.5.35	161,550	— 25,002	5	620,925	705,202	— 84,277	,,	131	122¾	121½§	7 15/16
	Rohilkund & Kumaon ..	572	20.5.35	13,890	— 2,694	6	78,809	88,136	— 9,327	,,	263	250	290½	5½
	South India	2,526	30.4.35	111,505	— 7,481	4	335,877	346,286	— 10,409	,,	119	115	117½	6 13/16
Various.	Beira-Umtali	204	Mar., 1935	73,647	+ 24,140	26	378,782	290,974	+ 87,808	—	—	—	—	—
	Bilbao River & Cantabrian	15	May, 1935	1,493	+ 143	21	8,644	9,100	— 456	—	—	—	—	—
	Egyptian Delta	622	20.5.35	4,907	+ 43	6	26,056	25,756	+ 300	Prf. Sh.	21 3/16	18¼	17⅞	5⅝
	Great Southern of Spain ..	104	25.5.35	2,094	— 780	21	40,058	46,782	— 6,724	Inc. Deb.	4	3½	3½	Nil
	Kenya & Uganda	1,625	Apr., 1935	222,462	+ 6,476	17	924,843	859,480	+ 65,363	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50	33	44½	7⅞
	Mashonaland	913	Mar., 1935	118,527	+ 29,656	26	687,786	530,604	+ 157,182	1 Mg. Db.	101	91¾	102½	4⅞
	Midland of W. Australia ..	277	Apl., 1935	12,561	+ 735	43	134,787	134,040	+ 747	Inc. Deb.	100	93	96½	5 5/16
	Nigerian	1,905	20.4.35	24,438	— 3,775	3	87,509	84,523	+ 2,986	—	—	—	—	—
	Rhodesia	1,538	Mar., 1935	206,064	+ 52,199	26	1,137,061	908,456	+ 228,605	4 p.c. Db.	104⅞	97½	103½	3⅞
	South African	13,217	11.5.35	520,692	+ 54,649	6	3,207,023	2,838,600	+ 368,423	—	—	—	—	—
	Victorian	6,172	Jan., 1935	834,638	— 17,346	30	5,586,612	5,388,619	+ 197,993	—	—	—	—	—
	Zafra & Huelva	112	Apl., 1935	11,587	+ 1,622	17	44,550	44,641	— 91	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value